

RC  
1042  
.L66  
1994c



U.S. Department  
of Transportation

National Highway  
Traffic Safety  
Administration

---

DOT HS 808 220

June 1994

Final Report

# **Final Report of a 1991 Chevrolet Silverado into a 50% Left Offset Barrier in Support of CRASH3 Damage Algorithm Reformulation**

## Notice

Transportation Research Center Inc. does not endorse or certify products of manufacturers. The manufacturer's name appears solely to identify the test article. Transportation Research Center Inc. assumes no liability for the report or use thereof. It is responsible for the facts and the accuracy of the data presented herein. This report does not constitute a standard, specification, or regulation.

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

1. Report No. DOT HS 808 220	2. Government Accession No.	3. Recipient's Catalog No.																															
4. Title and Subtitle Final Report Of A 1991 Chevrolet Silverado Into A 50% Left Offset Barrier In Support Of CRASH3 Damage Algorithm Reformulation		5. Report Date June 1994																															
		6. Performing Organization Code																															
7. Author(s) K. W. Looker, Project Engineer, TRC		8. Performing Organization Report No. 940613																															
9. Performing Organization Name and Address National Highway Traffic Safety Admin. Vehicle Research and Test Center P. O. Box 37 East Liberty, OH 43319		10. Work Unit No. (TRAIS)																															
		11. Contract or Grant No. DTNH22-88-C-07292																															
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh St., S.W. Washington, DC 20590		13. Type of Report and Period Covered Final Report June - July 1994																															
		14. Sponsoring agency Code DOT/NHTSA/VRTC																															
15. Supplemental Notes																																	
16. Abstract  Five (5) 50% left offset barrier impact tests were conducted for research and development in support of the CRASH3 damage algorithm reformulation. These tests were conducted on a 1991 Chevrolet Silverado, VIN 1GCDG14ZOMZ208775, at Transportation Research Center Inc. on June 13, 1994. The following five tests were conducted on the vehicle:																																	
<table border="1"> <thead> <tr> <th>Test No.</th> <th>Date</th> <th>Time</th> <th>Speed (Kph)</th> <th>Maximum Cumulative Crush (mm)</th> </tr> </thead> <tbody> <tr> <td>940613-1</td> <td>06/13/94</td> <td>0908</td> <td>16.1</td> <td>200</td> </tr> <tr> <td>940613-2</td> <td>06/13/94</td> <td>1031</td> <td>24.1</td> <td>446</td> </tr> <tr> <td>940613-3</td> <td>06/13/94</td> <td>1119</td> <td>24.1</td> <td>570</td> </tr> <tr> <td>940613-4</td> <td>06/13/94</td> <td>1333</td> <td>24.1</td> <td>650</td> </tr> <tr> <td>940613-5</td> <td>06/13/94</td> <td>1459</td> <td>55.8</td> <td>1273</td> </tr> </tbody> </table>				Test No.	Date	Time	Speed (Kph)	Maximum Cumulative Crush (mm)	940613-1	06/13/94	0908	16.1	200	940613-2	06/13/94	1031	24.1	446	940613-3	06/13/94	1119	24.1	570	940613-4	06/13/94	1333	24.1	650	940613-5	06/13/94	1459	55.8	1273
Test No.	Date	Time	Speed (Kph)	Maximum Cumulative Crush (mm)																													
940613-1	06/13/94	0908	16.1	200																													
940613-2	06/13/94	1031	24.1	446																													
940613-3	06/13/94	1119	24.1	570																													
940613-4	06/13/94	1333	24.1	650																													
940613-5	06/13/94	1459	55.8	1273																													
17. Key Words 50% Left Offset Barrier Impact Tests 1991 Chevrolet Silverado CRASH3 Damage Algorithm Reformulation		18. Distribution Statement Document is available to the public through the National Technical Information Service Springfield, Virginia 22161																															
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. Number of Pages 199	22. Price DEPARTMENT OF TRANSPORTATION																														

# METRIC CONVERSION FACTORS

## Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
m	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km

<b>AREA</b>				
m <sup>2</sup>	square inches	6.5	square centimeters	cm <sup>2</sup>
ft <sup>2</sup>	square feet	0.09	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yards	0.8	square meters	m <sup>2</sup>
mi <sup>2</sup>	square miles	2.6	square kilometers	km <sup>2</sup>
	acres	0.4	hectares	ha

<b>MASS (weight)</b>				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t

<b>VOLUME</b>				
tsp	teaspoons	5	milliliters	ml
Thsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft <sup>3</sup>	cubic feet	0.03	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.76	cubic meters	m <sup>3</sup>

<b>TEMPERATURE (exact)</b>				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

## Approximate Conversions from Metric Measures

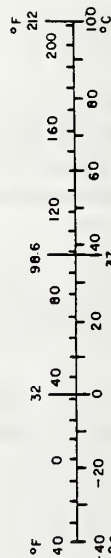
Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi

<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	

<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	

<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m <sup>3</sup>	cubic meters	35	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>

<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



\*1 m = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10-286.

## Table Of Contents

Section	Title	Page
1.0	Purpose and Test Procedure	1-1
2.0	Vehicle and Test Data	2-1
3.0	Summary Test No. 940613-1	3-1
4.0	Summary Test No. 940613-2	4-1
5.0	Summary Test No. 940613-3	5-1
6.0	Summary Test No. 940613-4	6-1
7.0	Summary Test No. 940613-5	7-1
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	Miscellaneous Test Information	C-1

### List Of Tables

Number	Description	Page
1	Test Vehicle Information	2-2
2	Profile Measurements at Vehicle Bumper Height	2-5
3	Test Conditions Test No. 940613-1	3-2
4	Vehicle Crush at Vehicle Bumper Height Test No. 940613-1	3-3
5	Vehicle Measurements Test No. 940613-1	3-5
6	Vehicle Accelerometer Locations and Data Summary Test No. 940613-1	3-6
7	Camera Information Test No. 940613-1	3-7
8	Test Conditions Test No. 940613-2	4-2
9	Vehicle Crush at Vehicle Bumper Height Test No. 940613-2	4-3
10	Vehicle Measurements Test No. 940613-2	4-5
11	Vehicle Accelerometer Locations and Data Summary Test No. 940613-2	4-6
12	Camera Information Test No. 940613-2	4-7
13	Test Conditions Test No. 940613-3	5-2
14	Vehicle Crush at Vehicle Bumper Height Test No. 940613-3	5-3
15	Vehicle Measurements Test No. 940613-3	5-5
16	Vehicle Accelerometer Locations and Data Summary Test No. 940613-3	5-6
17	Camera Information Test No. 940613-3	5-7
18	Test Conditions Test No. 940613-4	6-2
19	Vehicle Crush at Vehicle Bumper Height Test No. 940613-4	6-3
20	Vehicle Measurements Test No. 940613-4	6-5
21	Vehicle Accelerometer Locations and Data Summary Test No. 940613-4	6-6
22	Camera Information Test No. 940613-4	6-7

List Of Tables, Cont'd.

Number	Description	Page
23	Test Conditions Test No. 940613-5	7-2
24	Vehicle Crush at Vehicle Bumper Height Test No. 940613-5	7-3
25	Vehicle Measurements Test No. 940613-5	7-5
26	Vehicle Accelerometer Locations and Data Summary Test No. 940613-5	7-6
27	Camera Information Test No. 940613-5	7-7

### List Of Figures

Number	Description	Page
1	Vehicle Accelerometer Placement	2-9
2	Camera Positions	2-10
3	Vehicle Crush Profile At Bumper Height Test No. 940613-1	3-4
4	Vehicle Crush Profile At Bumper Height Test No. 940613-2	4-4
5	Vehicle Crush Profile At Bumper Height Test No. 940613-3	5-4
6	Vehicle Crush Profile At Bumper Height Test No. 940613-4	6-4
7	Vehicle Crush Profile At Bumper Height Test No. 940613-5	7-4

## Section 1.0

### **Purpose And Test Procedure**

### Purpose And Test Procedure

The purpose of the five (5) 50% left frontal offset barrier impact tests was for research and development in support of the CRASH3 damage algorithm reformulation.

The 1991 Chevrolet Silverado pickup truck was equipped with a 4.3-liter, 6-cylinder, inline, gasoline engine with a 4-speed automatic transmission. The test weight of the vehicle was 1823 kilograms.

The vehicle was instrumented with seven (7) accelerometers to measure vehicle X-axis and Y-axis acceleration.

Each crash test event was recorded by three (3) high-speed motion picture cameras operating at approximately 1000 frames per second.

### Data Acquisition Explanations

Test Number 940613-3:

The left rear sill X-axis acceleration data channel, LRSXG1, exceeded its data channel full scale output at approximately 26 milliseconds. This full scale over range also affected the computations of the left rear sill X-axis velocity and displacement.

The vehicle center of gravity Z-axis acceleration data channel, VCGZG1, exceeded its data channel full scale output at approximately 26 milliseconds. This full scale over range also affected the computations of the vehicle center of gravity Z-axis velocity, displacement, and resultant acceleration.



## Section 2.0

### **Vehicle And Test Data**

Table 1 Test Vehicle Information

Vehicle Manufacturer: General Motors Corp.      Model Year: 1991  
Make/Model: Chevrolet/Silverado      VIN: 1GCDC14ZOMZ208775  
Body Style: Pickup Truck      Color: Red  
Engine Data: Type: Inline      Cylinders: 6      Displacement: 4.3-liter  
Transmission Data: 4 Speed,    Manual, X Automatic,    Fwd, X Rwd,    4wd  
Date Vehicle Received: 06/08/94      Odometer Reading: 52431.5  
Dealer's Name And Address: NA

Accessories:

Power Steering	Yes	Automatic Transmission	Yes
Power Brakes	Yes	Automatic Speed Control	Yes
Power Seats	No	Tilting Steering Wheel	Yes
Power Windows	No	Telescoping Steering Wheel	No
Tinted Glass	Yes	Air Conditioning	No
Radio	Yes	Anti-Skid Brake	Yes
Clock	Yes	Rear Window Defroster	No
Other	None		

Remarks:

1. Is the vehicle stock throughout? Yes
2. Does vehicle show evidence of prior accident history? No
3. Does vehicle show any significant corrosion? No
4. Condition of the front/rear bumper and frame: Good

Certification Data From Vehicle's Label:

Vehicle Manufactured By: General Motors Corp.  
Date Of Manufacture: 06/91      VIN: 1GCDC14ZOMZ208775  
GVWR: 5600 lbs.  
GAWR: Front: 2950 lbs., Rear: 3404 lbs.

Table 1 Test Vehicle Information, Cont'd.

Tires On Vehicle (Mfr., Line, Size): Firestone, FR 480, P235/75R15 M+S

Tire Pressure With Maximum Capacity Vehicle Load: Front: 220 kPa

Rear: 220 kPa

Spare Tire (Mfr., Line, Size): The vehicle did not have a spare tire.

Type Of Seats: Front: Bench

Rear: NA

Type Of Front Seat Backs: Fixed

Maximum Width: 1949 mm

Wheelbase: 2997 mm

Location Of Label Stating Tire Data:

The label was located on the driver's door.

Tire & Capacity Data From Vehicle's Label:

Recommended Tire Size: P225/75R15

Recommended Cold Tire Pressure: Front: 220 kPa; Rear: 240 kPa

Designated Seating Capacity: NA Front NA Rear NA Total

Vehicle Capacity Weight: NA lbs.

Test Vehicle Attitude (All Measurements Are In Millimeters):

Delivered Attitude: LF 820; RF 827; LR ; RR

Pre-Test Attitude<sup>1</sup>: LF 936; RF 934; LR 918; RR 905

<sup>1</sup>Pre-test attitude measured with third axle installed.

Table 1 Test Vehicle Information, Cont'd.

Weight Of Test Vehicle As Received (With Maximum Fluids):

Right Front	473	KG	Right Rear	364	KG
Left Front	489	KG	Left Rear	357	KG
Total Front Weight	962	KG	(57.2% Of Total Vehicle Weight)		
Total Rear Weight	721	KG	(42.8% Of Total Vehicle Weight)		
Total Delivered Weight	1683	KG			

Weight Of Test Vehicle:

Right Front <sup>1</sup>	680	KG	Right Rear	225	KG
Left Front <sup>1</sup>	689	KG	Left Rear	229	KG
Total Front Weight <sup>1</sup>	1369	KG	(75.1% Of Total Vehicle Weight)		
Total Rear Weight	454	KG	(24.9% Of Total Vehicle Weight)		
Total Test Weight	1823	KG			

Weight Of Ballast Secured In Vehicle Cargo Area: None

Components Removed To Meet Target Test Weight: None

CG = 1275 MM Rearward Of Third Axle Centerline

<sup>1</sup> Front wheel weights are for third axle wheels 705 mm behind the front wheel centerline.

Table 2  
Profile Measurements At Vehicle Bumper Height 440 MM

Location	0		1		2		3		4		5		6		7	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Pre-Test	2821	525	2742	522	2677	523	2596	522	2592	519	2444	521	2366	519	2298	519
Post-Test 1	2821	525	2742	522	2677	523	2596	522	2592	519	2444	521	2366	519	2298	519
Post-Test 2	2821	525	2742	522	2677	523	2596	522	2592	519	2444	521	2366	519	2298	519
Post-Test 3	2850	516	2770	517	2695	507	2626	513	2554	500	2472	498	2400	505	2330	494
Post-Test 4	2862	550	2794	551	2724	548	2646	546	2572	541	2502	534	2428	532	2355	526
Post-Test 5	2993	622	3055	507	3003	476	2962	407	2910	345	2860	282	2810	225	2741	257

Location	8		9		10		11		12		13		14		15	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Pre-Test	2221	519	2148	522	2068	517	1992	520	1914	517	1844	517	1770	520	1696	519
Post-Test 1	2221	519	2148	522	2068	517	1992	520	1931	503	1854	503	1784	503	1711	503
Post-Test 2	2221	519	2148	522	2068	517	1992	520	1927	512	1852	512	1780	517	1703	513
Post-Test 3	2243	498	2180	497	2097	499	2022	493	1955	498	1876	492	1802	496	1722	496
Post-Test 4	2280	528	2208	536	2128	517	2052	516	1976	516	1900	512	1825	513	1752	514
Post-Test 5	2673	288	2614	317	2544	347	2482	380	2417	410	2354	450	2290	490	2230	520

Location	16		17		18		19		20		21		22		23	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Pre-Test	1622	517	1550	519	1470	523	1398	510	1324	509	1252	514	1173	515	1096	515
Post-Test 1	1640	502	1570	506	1490	502	1422	498	1343	494	1266	493	1192	493	1116	492
Post-Test 2	1630	520	1557	518	1480	521	1410	520	1338	511	1262	514	1187	518	1110	528
Post-Test 3	1650	495	1585	498	1517	497	1442	496	1376	496	1305	494	1233	496	1155	496
Post-Test 4	1675	514	1624	495	1548	503	1486	503	1441	488	1388	490	1320	495	1245	501
Post-Test 5	2180	510	2191	502	2117	528	2051	507	2036	489	1990	482	1940	480	1881	495

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 5000 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1500 millimeters from and parallel to the vehicle's longitudinal centerline

Table 2, Cont'd.  
Profile Measurements At Vehicle Bumper Height 440 MM

Location	24	25	26	27	28	29	30	31
	X	Y	X	Y	X	Y	X	Y
Pre-Test	1026	516	948	525	872	532	872	532
Post-Test 1	1040	503	964	503	886	503	886	503
Post-Test 2	1028	528	957	529	888	537	888	537
Post-Test 3	1080	510	1012	509	925	507	925	507
Post-Test 4	1169	511	1100	524	1026	527	1026	527
Post-Test 5	1847	488	1815	480	1744	458	1744	458

Location	32	33	34	35	36	37	38	39
	X	Y	X	Y	X	Y	X	Y
Pre-Test	425	546	356	567	302	609	302	609
Post-Test 1	542	517	466	543	423	605	423	605
Post-Test 2	735	518	675	550	634	599	634	599
Post-Test 3	880	482	817	507	755	570	755	570
Post-Test 4	935	516	858	555	830	584	830	584
Post-Test 5	1642	441	1582	468	1545	509	1545	509

Location	40	41	42	43	44	45	46	47
	X	Y	X	Y	X	Y	X	Y
Pre-Test	185	1038	170	1117	160	1192	160	1192
Post-Test 1	326	1046	321	1126	333	1200	333	1200
Post-Test 2	576	1057	573	1133	576	1209	576	1209
Post-Test 3	708	1014	712	1090	702	1163	702	1163
Post-Test 4	768	1029	773	1104	776	1182	776	1182
Post-Test 5	1415	960	1415	1035	1405	1105	1405	1105

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 5000 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1500 millimeters from and parallel to the vehicle's longitudinal centerline

Table 2, Cont'd.

## Profile Measurements At Vehicle Bumper Height 440 MM

Location	48	49	50	51	52	53	54	55
	X	Y	X	Y	X	Y	X	Y
Pre-Test	111	1634	144	1709	140	1783	161	1858
Post-Test 1	218	1603	204	1676	194	1751	194	1824
Post-Test 2	375	1562	330	1630	298	1697	270	1765
Post-Test 3	465	1463	420	1527	375	1597	330	1657
Post-Test 4	516	1447	469	1513	427	1572	358	1628
Post-Test 5	1076	1074	1010	1093	896	1137	826	1149

Location	56	57	58	59	60	61	62	63
	X	Y	X	Y	X	Y	X	Y
Pre-Test	245	2217	270	2287	315	2343	370	2381
Post-Test 1	177	2197	180	2273	204	2343	262	2391
Post-Test 2	140	2108	124	2167	127	2235	159	2301
Post-Test 3	136	1971	100	2032	92	2102	119	2173
Post-Test 4	134	1925	86	1997	78	2064	98	2133
Post-Test 5	440	1289	365	1328	308	1371	285	1439

Location	64	65	66	67	68	69	70	71
	X	Y	X	Y	X	Y	X	Y
Pre-Test	740	2389	822	2404	898	2409	970	2413
Post-Test 1	748	2375	828	2379	905	2374	980	2399
Post-Test 2	750	2382	829	2384	909	2389	1000	2403
Post-Test 3	740	2321	816	2332	890	2347	965	2359
Post-Test 4	734	2300	804	2309	877	2337	952	2354
Post-Test 5	811	1926	872	1965	942	2000	995	2055

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 5000 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1500 millimeters from and parallel to the vehicle's longitudinal centerline

Table 2, Cont'd.  
Profile Measurements At Vehicle Bumper Height 440 MM

Location	72		73		74		75		76		77		78		79	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Pre-Test	1370	2433	1440	2419	1508	2421	1582	2425	1657	2426	1728	2432	1802	2434	1875	2429
Post-Test 1	1364	2413	1426	2411	1497	2425	1575	2423	1646	2423	1724	2423	1795	2423	1870	2429
Post-Test 2	1370	2419	1446	2425	1520	2426	1600	2426	1676	2436	1749	2444	1829	2444	1900	2445
Post-Test 3	1344	2406	1415	2397	1495	2403	1570	2405	1645	2421	1718	2421	1795	2429	1870	2434
Post-Test 4	1335	2403	1412	2393	1488	2421	1567	2422	1636	2425	1712	2441	1785	2445	1860	2445
Post-Test 5	1325	2265	1414	2287	1472	2313	1591	2379	1660	2397	1731	2422	1806	2443	1882	2464

Location	80		81		82		83		84		85		86		87	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
Pre-Test	1952	2437	2026	2444	2100	2446	2180	2448	2252	2449	2330	2447	2406	2450	2478	2449
Post-Test 1	1952	2437	2026	2444	2100	2446	2180	2448	2252	2449	2330	2447	2406	2450	2478	2449
Post-Test 2	1952	2437	2026	2444	2100	2446	2180	2448	2252	2449	2330	2447	2406	2450	2478	2449
Post-Test 3	1942	2432	2016	2437	2091	2447	2171	2443	2245	2447	2320	2452	2398	2452	2472	2461
Post-Test 4	1933	2442	2012	2455	2087	2454	2159	2451	2233	2462	2313	2458	2386	2450	2462	2470
Post-Test 5	1958	2477	2032	2434	2108	2523	2182	2530	2255	2554	2330	2579	2407	2579	2483	2597

Location	88	89	90	91	92	93	94	95
	X	Y	X	Y	X	Y	X	Y
Pre-Test	2555	2450	2629	2456	2702	2457	2774	2456
Post-Test 1	2555	2450	2629	2456	2702	2457	2774	2456
Post-Test 2	2555	2450	2629	2456	2702	2457	2774	2456
Post-Test 3	2545	2464	2622	2466	2695	2466	2770	2471
Post-Test 4	2535	2474	2619	2473	2683	2473	2760	2471
Post-Test 5	2556	2619	2635	2629	2705	2644	2783	2663

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 5000 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1500 millimeters from and parallel to the vehicle's longitudinal centerline

Figure 1 Vehicle Accelerometer Placement

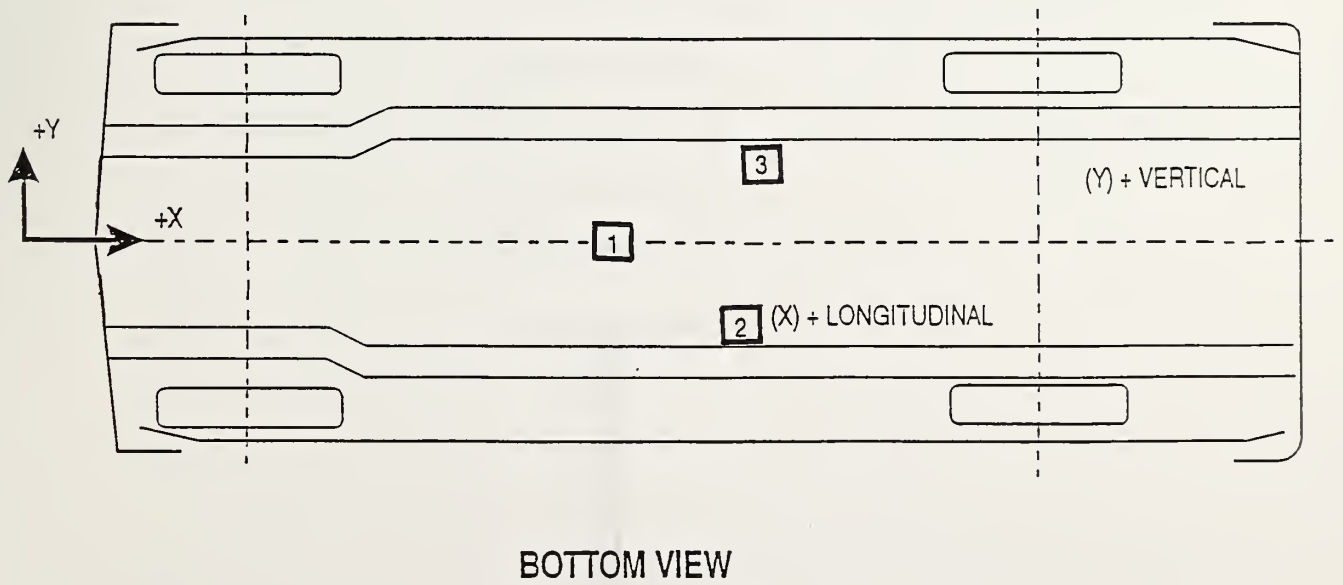
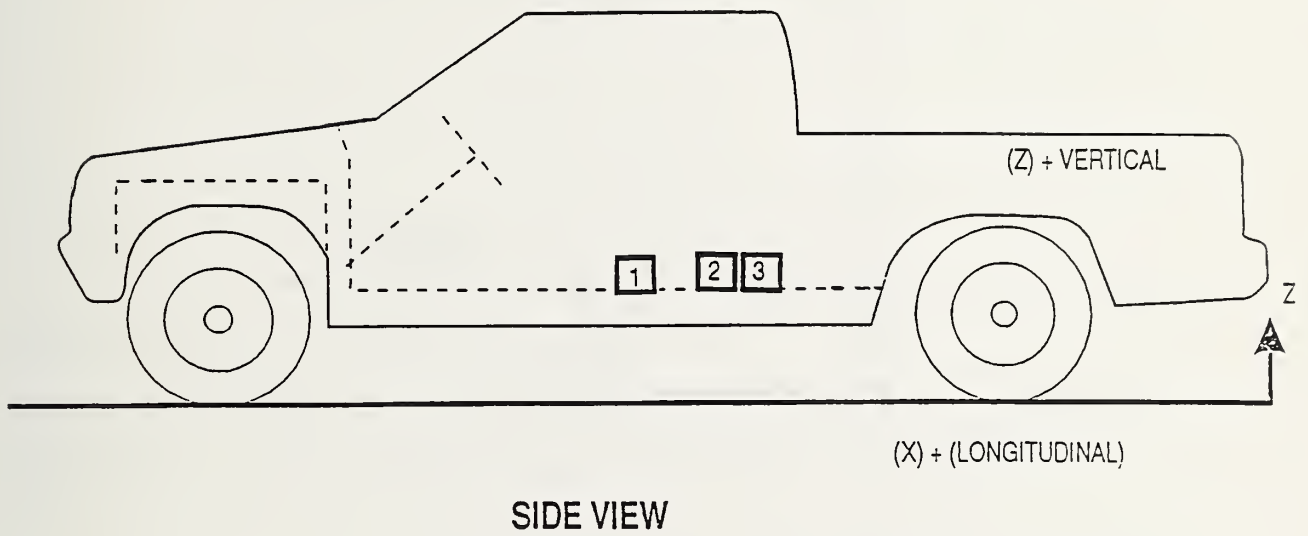
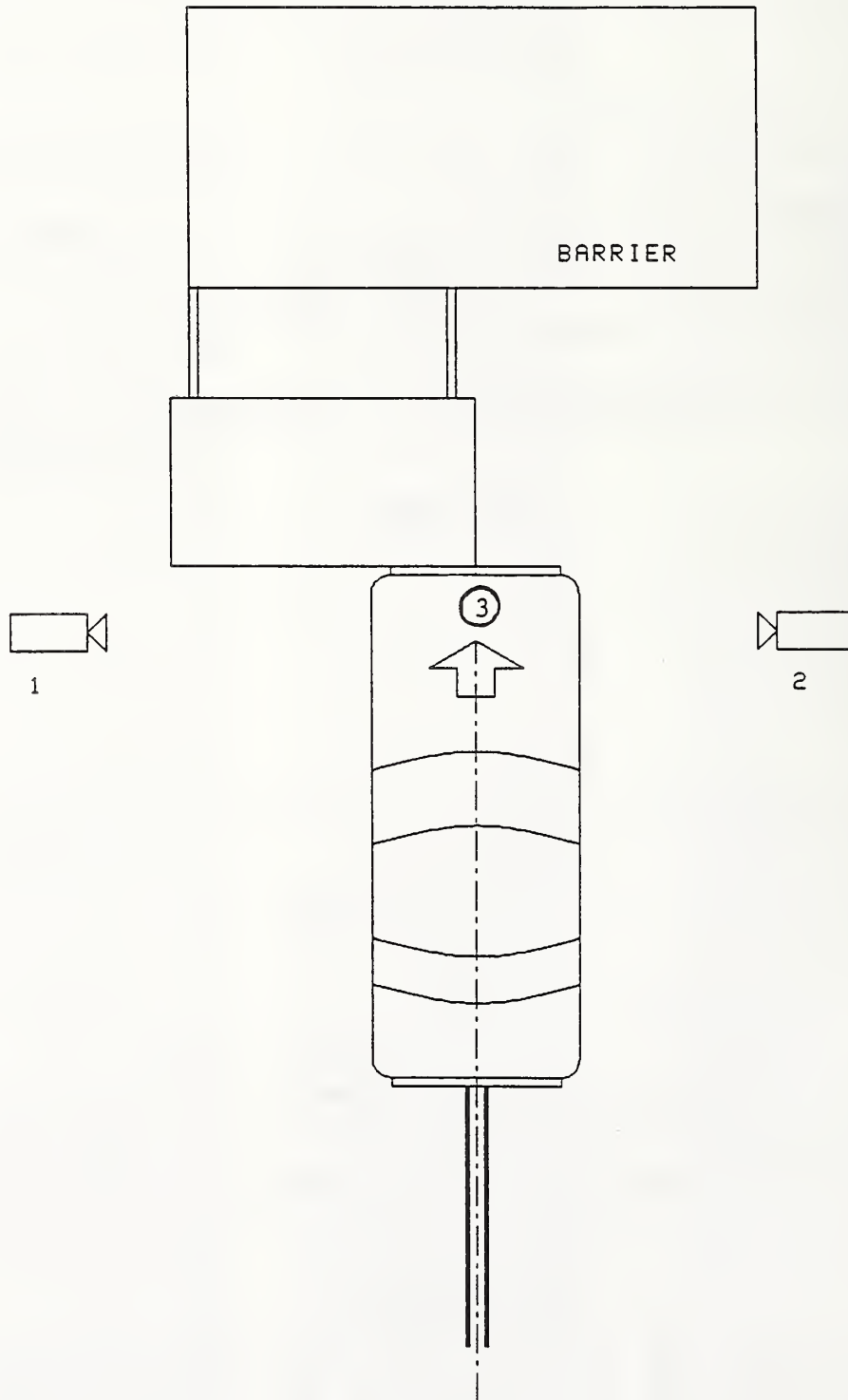


Figure 2 Camera Positions



## Section 3.0

### Summary

Test 940613-1

### Table 3 Test Conditions

Test No. 940613-1

Date Of Test: 06/13/94

Time Of Test: 09:08

Ambient Temperature At Impact Area: 22° C

Intended Impact Velocity: 16.1 kph

**Actual Impact Velocity:**

Primary	= 16.1 kph
Secondary	= 16.1 kph

### Subject Vehicle Data

**Length Of Direct Contact Damage: 835 MM**

### Maximum Cumulative Crush

At Vehicle Bumper Height: 200 MM

Vehicle Attitudes:

Post-Test: LF: 940; RF: 938; LR: 911; RR: 904

All distance measurements are in millimeters.

Table 4 Vehicle Crush At Vehicle Bumper Height

Test No. 940613-1

$$FL = \underline{\quad 1848 \quad}$$

$$C1 = \underline{\quad 110 \quad}$$

$$C2 = \underline{\quad 137 \quad}$$

$$C3 = \underline{\quad 199 \quad}$$

$$C4 = \underline{\quad 76 \quad}$$

$$C5 = \underline{\quad -17 \quad}$$

$$C6 = \underline{\quad -108 \quad}$$

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

All measurements are in millimeters.

Figure 3 Vehicle Crush Profile At Bumper Height  
Test 940613-1

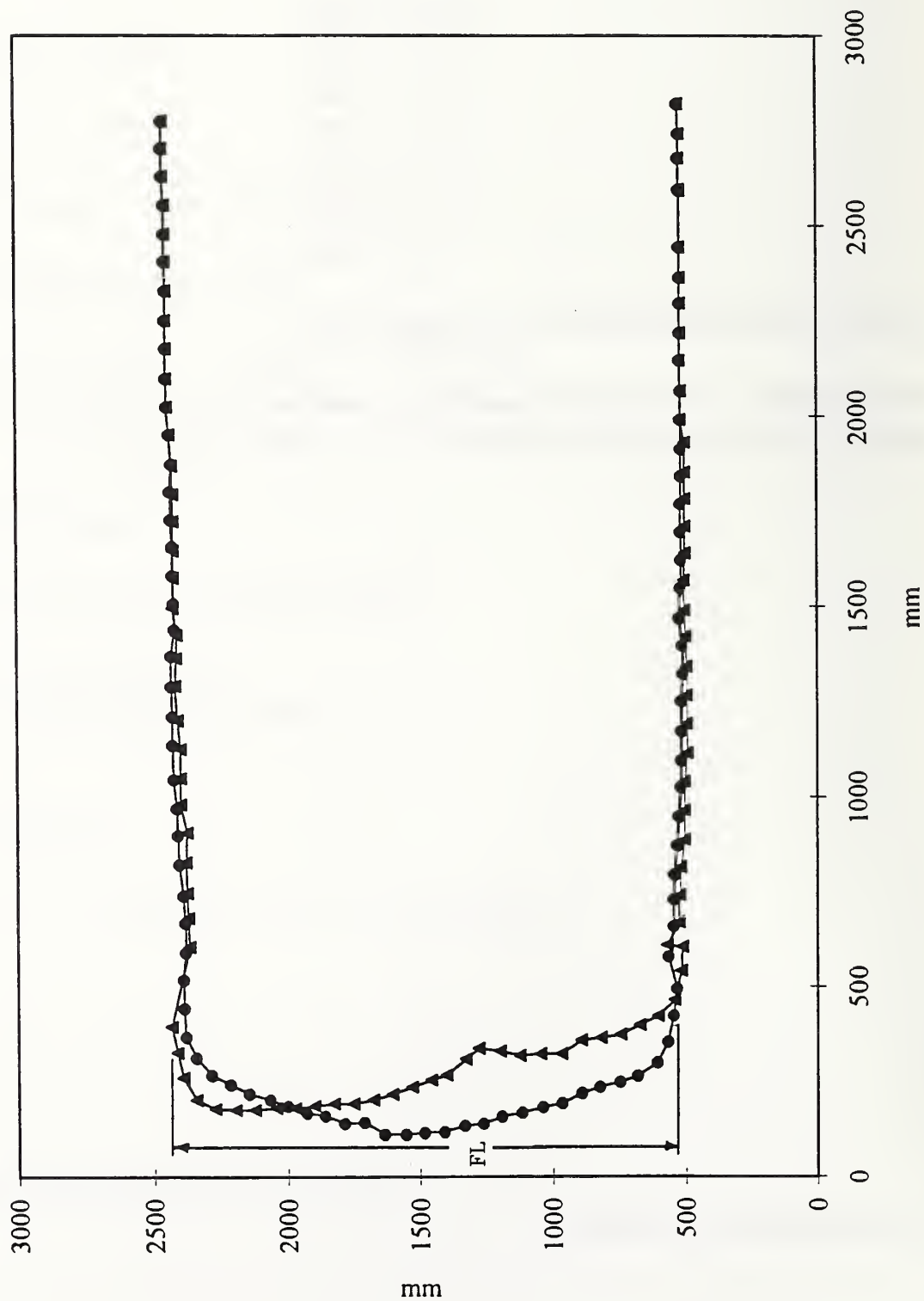


Table 5 Impacted Vehicle Measurements

Test No. 940613-1

Vehicle Make/Model: Chevrolet/Silverado

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4885	4744	141
X2	Rear Surface Of Vehicle To Front Of Engine Block	4175	4175	0
X3	Rear Surface Of Vehicle To Firewall	3692	3692	0
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3438	3438	0
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3425	3418	7
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3385	3385	0
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3374	3369	
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2225	2225	0
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2193	2192	1
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2220	2220	0
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2175	2191	-16
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	3384	3384	0
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	3364	3364	0
X14	Rear Surface Of Vehicle To Firewall - Right Side	3670	3670	0
X15	Rear Surface Of Vehicle To Firewall - Left Side	3660	3660	0
X16	Rear Surface Of Vehicle To Steering Wheel Center	2835	2835	0
X17	Center Of Steering Column To "A" Post	275	275	0
X18	Center Of Steering Column To Headliner	448	448	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	4729	4820	-91
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4707	4577	130
X21	Length Of Engine Block	430	430	0

All distance measurements are in millimeters.

Table 6 Vehicle Accelerometer Locations And Data Summary

TEST NUMBER: 940613-1 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	3340 mm	0 mm	764 mm		
LONGITUDINAL				1.1 g @ 136.4 ms	7.9 g @ 63.8 ms
LATERAL				3.6 g @ 57.6 ms	2.8 g @ 69.9 ms
VERTICAL				5.6 g @ 97.2 ms	2.6 g @ 76.1 ms
RESULTANT				8.3 g @ 97.3 ms	
2 LEFT REAR SILL	2167 mm	690 mm	683 mm		
LONGITUDINAL				1.8 g @ 133.6 ms	9.8 g @ 63.0 ms
LATERAL				1.1 g @ 58.9 ms	2.0 g @ 38.2 ms
3 RIGHT REAR SILL	2210 mm	-690 mm	735 mm		
LONGITUDINAL				1.2 g @ 131.9 ms	9.5 g @ 85.4 ms
LATERAL				1.1 g @ 150.5 ms	2.2 g @ 37.1 ms

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER  
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE  
Z: + UPWARD FROM GROUND LEVEL

Table 7 Camera Information

Test No. 940613-1

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose Of Camera Data</u>
1	Left tight	Photosonic	17	1015	Impact overall
2	Right tight	Photosonic	13	1005	Impact overall
3	Overhead	Photosonic	13	1010	Impact overall



Section 4.0

Summary

Test 940613-2

Table 8 Test Conditions

Test No. 940613-2

Date Of Test: 06/13/94

Time Of Test: 10:31

Ambient Temperature At Impact Area: 22° C

Intended Impact Velocity: 24.1 kph

Actual Impact Velocity:	Primary	= 24.1 kph
	Secondary	= 24.1 kph

Subject Vehicle Data

Length Of Direct Contact Damage: 860 mm

Maximum Cumulative Crush

At Vehicle Bumper Height: 446 mm

Vehicle Attitudes:

Post-Test: LF: 951; RF: 934; LR: 909; RR: 912

All distance measurements are in millimeters.

Table 9 Vehicle Crush At Vehicle Bumper Height

Test No. 940613-2

FL = 1853

C1 = 319

C2 = 364

C3 = 442

C4 = 173

C5 = -52

C6 = -232

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

All measurements are in millimeters.

Figure 4 Vehicle Crush Profile At Bumper Height  
Test 940613-2

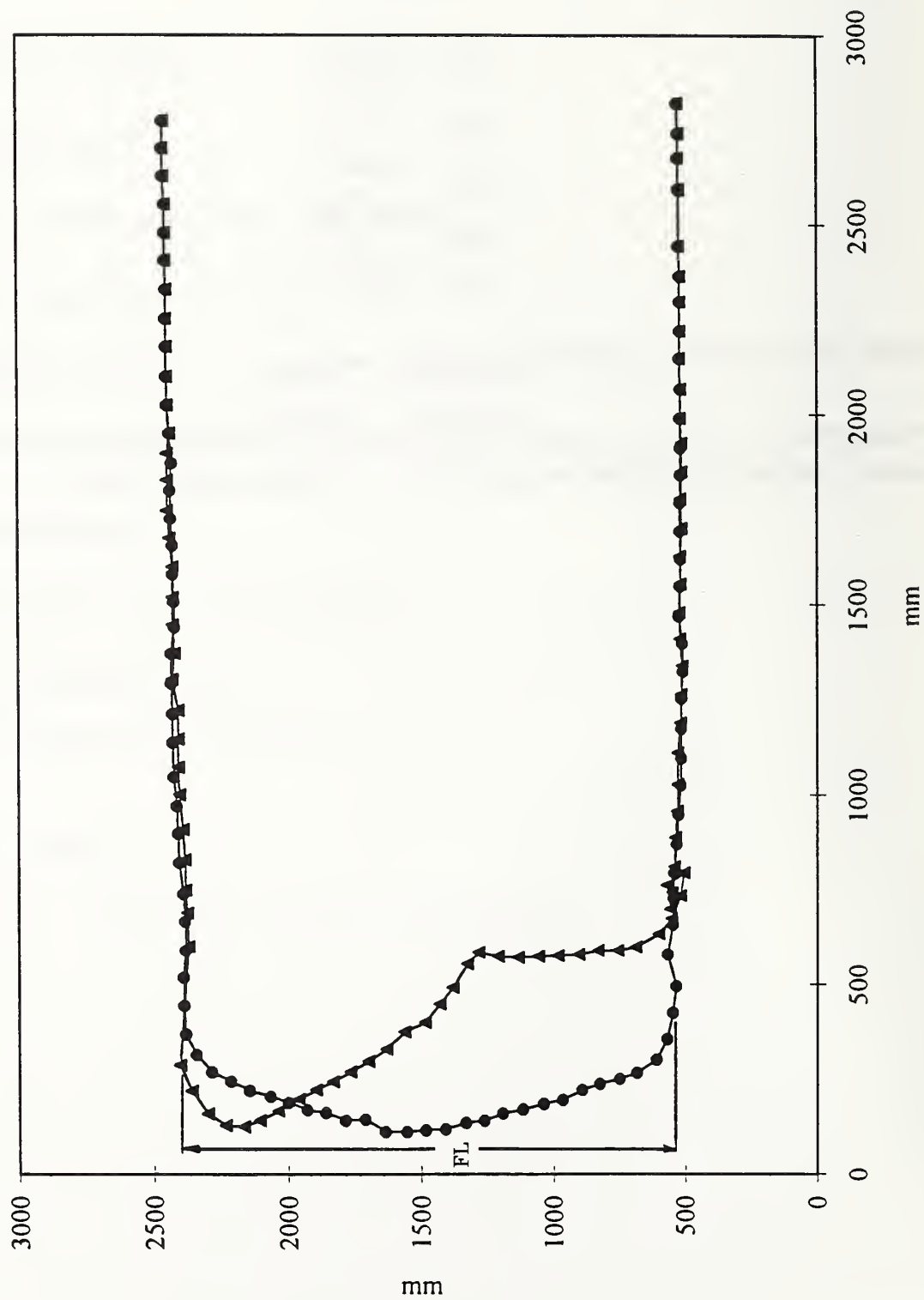


Table 10 Impacted Vehicle Measurements

Test No. 940613-2

Vehicle Make/Model: Chevrolet/Silverado

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4744	4551	193
X2	Rear Surface Of Vehicle To Front Of Engine Block	4175	NA <sup>1</sup>	NA <sup>1</sup>
X3	Rear Surface Of Vehicle To Firewall	3692	NA <sup>1</sup>	NA <sup>1</sup>
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3438	3438	0
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3418	3423	-5
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3385	3385	0
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3369	3372	-3
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2225	2225	0
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2192	2203	-11
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2220	2220	0
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2191	2194	-3
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	3384	3384	0
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	3364	3364	0
X14	Rear Surface Of Vehicle To Firewall - Right Side	3670	NA <sup>1</sup>	NA <sup>1</sup>
X15	Rear Surface Of Vehicle To Firewall - Left Side	3660	NA <sup>1</sup>	NA <sup>1</sup>
X16	Rear Surface Of Vehicle To Steering Wheel Center	2835	2835	0
X17	Center Of Steering Column To "A" Post	275	275	0
X18	Center Of Steering Column To Headliner	448	448	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	4820	4876	-56
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4577	4366	211
X21	Length Of Engine Block	430	NA <sup>1</sup>	NA <sup>1</sup>

<sup>1</sup> Vehicle crush obstructed measurement

All distance measurements are in millimeters.

Table 11 Vehicle Accelerometer Locations And Data Summary

TEST NUMBER: 940613-2 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	3340 mm	0 mm	764 mm		
LONGITUDINAL				0.2 g @ 107.0 ms	15.2 g @ 8.5 ms
LATERAL				4.8 g @ 2.9 ms	4.8 g @ 12.2 ms
VERTICAL				9.5 g @ 15.2 ms	5.6 g @ 4.7 ms
RESULTANT				15.4 g @ 9.0 ms	
2 LEFT REAR SILL	2167 mm	690 mm	683 mm		
LONGITUDINAL				1.6 g @ 110.2 ms	16.3 g @ 8.6 ms
LATERAL				2.8 g @ 78.4 ms	6.7 g @ 11.0 ms
3 RIGHT REAR SILL	2210 mm	-690 mm	735 mm		
LONGITUDINAL				1.4 g @ 133.3 ms	12.7 g @ 15.2 ms
LATERAL				2.5 g @ 78.2 ms	6.9 g @ 11.9 ms

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER  
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE  
Z: + UPWARD FROM GROUND LEVEL

Table 12 Camera Information

Test No. 940613-2

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose Of Camera Data</u>
1	Left tight	Photosonic	17	1015	Impact overall
2	Right tight	Photosonic	13	1010	Impact overall
3	Overhead	Photosonic	13	1008	Impact overall



## Section 5.0

### Summary

Test 940613-3

### Table 13 Test Conditions

Test No. 940613-3

Date Of Test: 06/13/94

Time Of Test: 11:19

Ambient Temperature At Impact Area: 24° C

Intended Impact Velocity: 24.1 kph

**Actual Impact Velocity:**

Primary	= 24.1 kph
Secondary	= 24.0 kph

### Subject Vehicle Data

Length Of Direct Contact Damage: 885 mm

Maximum Cumulative Crush  
At Vehicle Bumper Height: 570 mm

Vehicle Attitudes:

Post-Test: LF: 972; RF: 924; LR: 907; RR: 907

All distance measurements are in millimeters.

Table 14 Vehicle Crush At Vehicle Bumper Height

Test No. 940613-3

FL = 1803

C1 = 455

C2 = 495

C3 = 557

C4 = 254

C5 = -71

C6 = -297

NOTE: FL is post-test length of damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

All measurements are in millimeters.

Figure 5 Vehicle Crush Profile At Bumper Height  
Test 940613-3

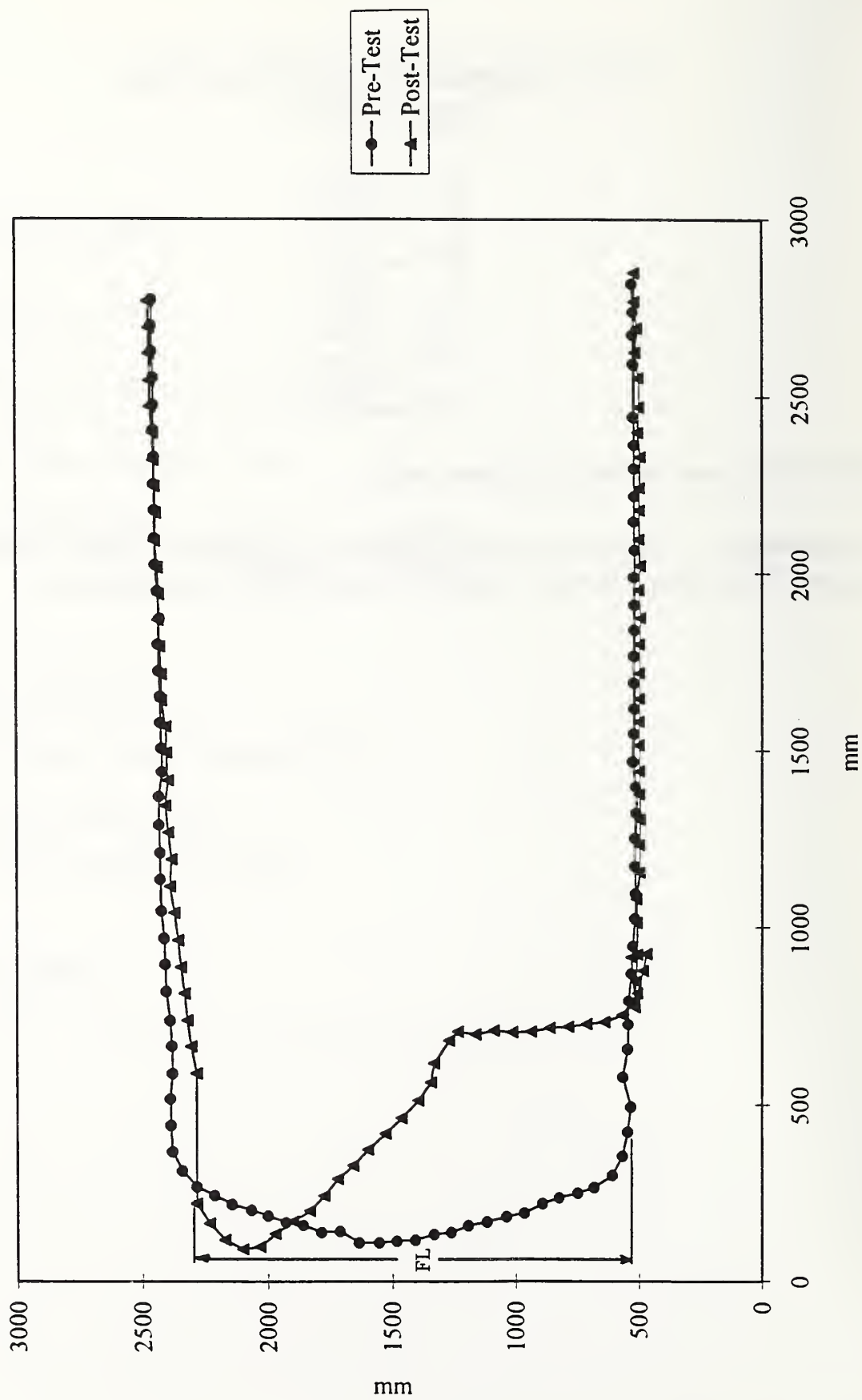


Table 15 Impacted Vehicle Measurements

Test No. 940613-3

Vehicle Make/Model: Chevrolet/Silverado

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4551	4435	116
X2	Rear Surface Of Vehicle To Front Of Engine Block	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X3	Rear Surface Of Vehicle To Firewall	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3438	3448	-10
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3423	3397	26
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3385	3397	-12
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3372	3353	19
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2225	2232	-7
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2203	2189	14
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2220	2232	-12
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2194	2188	6
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	3384	3384	0
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	3364	3364	0
X14	Rear Surface Of Vehicle To Firewall - Right Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X15	Rear Surface Of Vehicle To Firewall - Left Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X16	Rear Surface Of Vehicle To Steering Wheel Center	2835	2835	0
X17	Center Of Steering Column To "A" Post	275	275	0
X18	Center Of Steering Column To Headliner	448	448	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	4876	4900	-24
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4366	4245	121
X21	Length Of Engine Block	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>

<sup>1</sup>Vehicle crush obstructed measurement

All distance measurements are in millimeters.

Table 16 Vehicle Accelerometer Locations And Data Summary

TEST NUMBER: 940613-3 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3340 mm	0 mm	764 mm				
LONGITUDINAL				1.0 g	@ 133.8 ms	16.4 g	@ 34.7 ms
LATERAL				9.9 g	@ 37.0 ms	28.1 g	@ 22.5 ms
VERTICAL <sup>1</sup>				44.4 g	@ 26.3 ms	14.2 g	@ 30.6 ms
RESULTANT <sup>1</sup>				46.1 g	@ 26.3 ms		
2 LEFT REAR SILL	2167 mm	690 mm	683 mm				
LONGITUDINAL <sup>1</sup>				1.7 g	@ 113.0 ms	33.5 g	@ 29.7 ms
LATERAL				6.4 g	@ 78.6 ms	8.3 g	@ 13.6 ms
3 RIGHT REAR SILL	2210 mm	-690 mm	735 mm				
LONGITUDINAL				2.7 g	@ 118.0 ms	15.2 g	@ 29.8 ms
LATERAL				6.2 g	@ 76.3 ms	7.5 g	@ 14.9 ms

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER  
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE  
Z: + UPWARD FROM GROUND LEVEL

<sup>1</sup> See DATA ACQUISITION EXPLANATIONS

Table 17 Camera Information

Test No. 940613-3

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	17	1015	Impact overall
2	Right tight	Photosonic	13	1002	Impact overall
3	Overhead	Photosonic	13	1000	Impact overall



Section 6.0

Summary

Test 940613-4

Table 18 Test Conditions

Test No. 940613-4

Date Of Test: 06/13/94

Time Of Test: 13:33

Ambient Temperature At Impact Area: 25° C

Intended Impact Velocity: 24.1 kph

Actual Impact Velocity: Cable Speed<sup>1</sup> = 24.1 Kph

Subject Vehicle Data

Length Of Direct Contact Damage: 905 mm

Maximum Cumulative Crush

At Vehicle Bumper Height: 650 mm

Vehicle Attitudes:

Post-Test: LF: 990; RF: 906; LR: 882; RR: 918

<sup>1</sup>The light trap failed.

All distance measurements are in millimeters.

Table 19 Vehicle Crush At Vehicle Bumper Height

Test No. 940613-4

FL = 1755

C1 = 508

C2 = 558

C3 = 620

C4 = 307

C5 = -73

C6 = -323

NOTE: FL is post-test length of damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

All measurements are in millimeters.

Figure 6 Vehicle Crush Profile At Bumper Height  
Test 940613-4

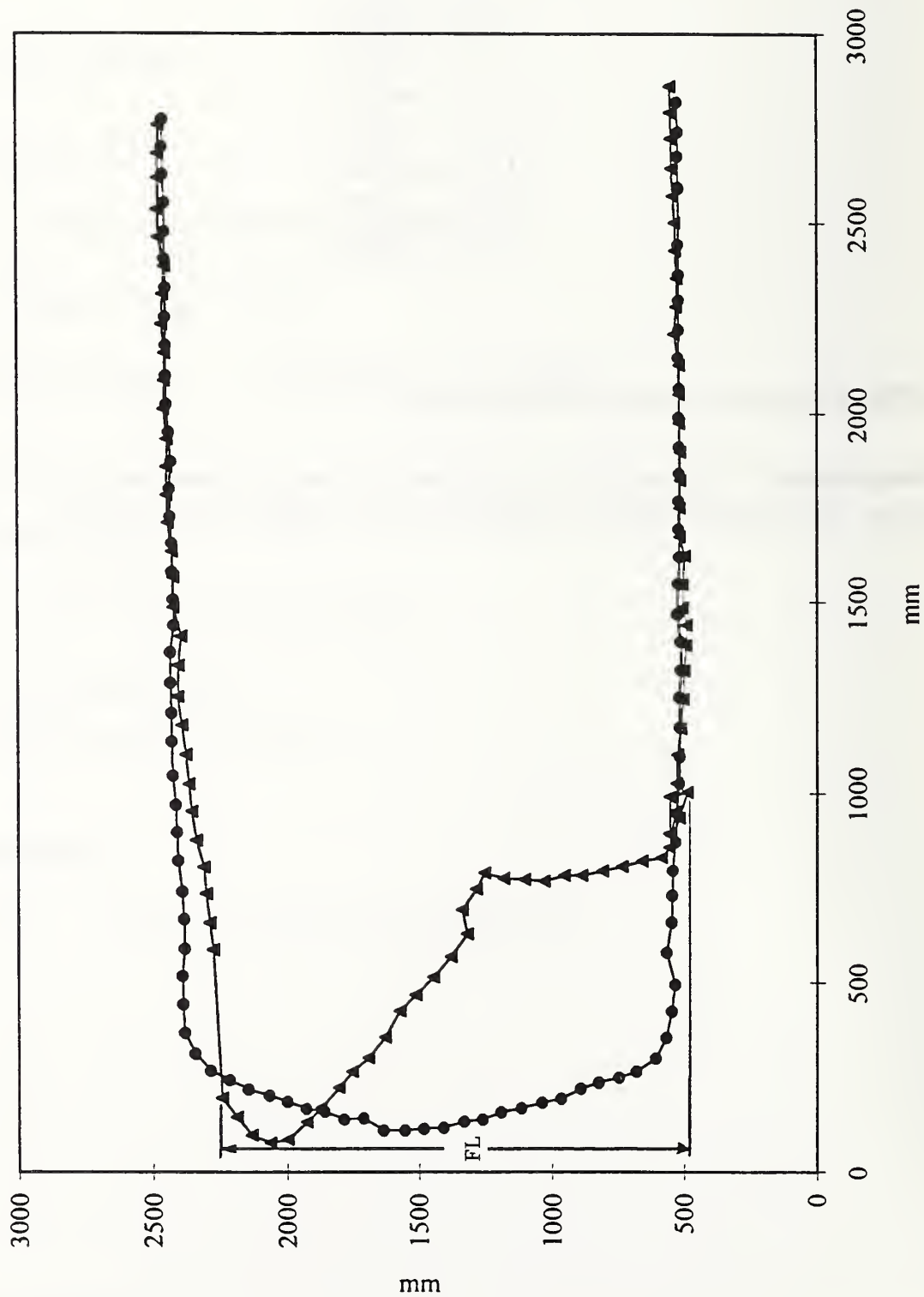


Table 20 Impacted Vehicle Measurements

Test No. 940613-4

Vehicle Make/Model: Chevrolet/Silverado

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4435	4370	65
X2	Rear Surface Of Vehicle To Front Of Engine Block	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X3	Rear Surface Of Vehicle To Firewall	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3448	3461	-13
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3397	3356	41
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3397	3412	-15
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3353	3334	19
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2232	2221	11
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2189	2146	43
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2232	2229	3
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2188	2157	31
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	3384	3384	0
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	3364	3364	0
X14	Rear Surface Of Vehicle To Firewall - Right Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X15	Rear Surface Of Vehicle To Firewall - Left Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X16	Rear Surface Of Vehicle To Steering Wheel Center	2835	2854	-19
X17	Center Of Steering Column To "A" Post	275	303	-28
X18	Center Of Steering Column To Headliner	448	455	-7
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	4900	4914	-14
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4245	4170	75
X21	Length Of Engine Block	NA	NA	NA

All distance measurements are in millimeters.

Table 21 Vehicle Accelerometer Locations And Data Summary

TEST NUMBER: 940613-4 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	3340 mm	0 mm	764 mm		
LONGITUDINAL				1.8 g @ 104.3 ms	24.3 g @ 21.9 ms
LATERAL				9.2 g @ 33.1 ms	41.1 g @ 20.5 ms
VERTICAL				59.3 g @ 25.4 ms	37.0 g @ 20.4 ms
RESULTANT				61.5 g @ 25.4 ms	
2 LEFT REAR SILL	2167 mm	690 mm	683 mm		
LONGITUDINAL				15.6 g @ 252.3 ms	46.6 g @ 19.8 ms
LATERAL				13.0 g @ 50.2 ms	21.3 g @ 20.8 ms
3 RIGHT REAR SILL	2210 mm	-690 mm	735 mm		
LONGITUDINAL				1.8 g @ 260.3 ms	20.9 g @ 51.6 ms
LATERAL				13.6 g @ 50.4 ms	19.6 g @ 21.8 ms

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER  
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE  
Z: + UPWARD FROM GROUND LEVEL

Table 22 Camera Information

Test No. 940613-4

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose Of Camera Data</u>
1	Left tight	Photosonic	17	1020	Impact overall
2	Right tight	Photosonic	13	1002	Impact overall
3	Overhead	Photosonic	13	1005	Impact overall



## Section 7.0

### Summary

Test 940613-5

### Table 23 Test Conditions

Test No. 940613-5

Date Of Test: 06/13/94

Time Of Test: 14:59

Ambient Temperature At Impact Area: 27° C

**Intended Impact Velocity: 56.3 kph**

**Actual Impact Velocity:**

Primary	=	55.8 kph
Secondary	=	55.8 kph

### Subject Vehicle Data

**Length Of Direct Contact Damage: 950 mm**

Maximum Cumulative Crush  
At Vehicle Bumper Height: 1273 mm

**Vehicle Attitudes:**

**Post-Test:** LF: 1142; RF: 955; LR: 911; RR: 919

All distance measurements are in millimeters.

Table 24 Vehicle Crush At Vehicle Bumper Height

Test No. 940613-5

FL = 1162

C1 = 1210

C2 = 1233

C3 = 1270

C4 = 1247

C5 = 32

C6 = -223

NOTE: FL is post-test length of damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

All measurements are in millimeters.

Figure 7 Vehicle Crush Profile At Bumper Height  
Test 940613-5

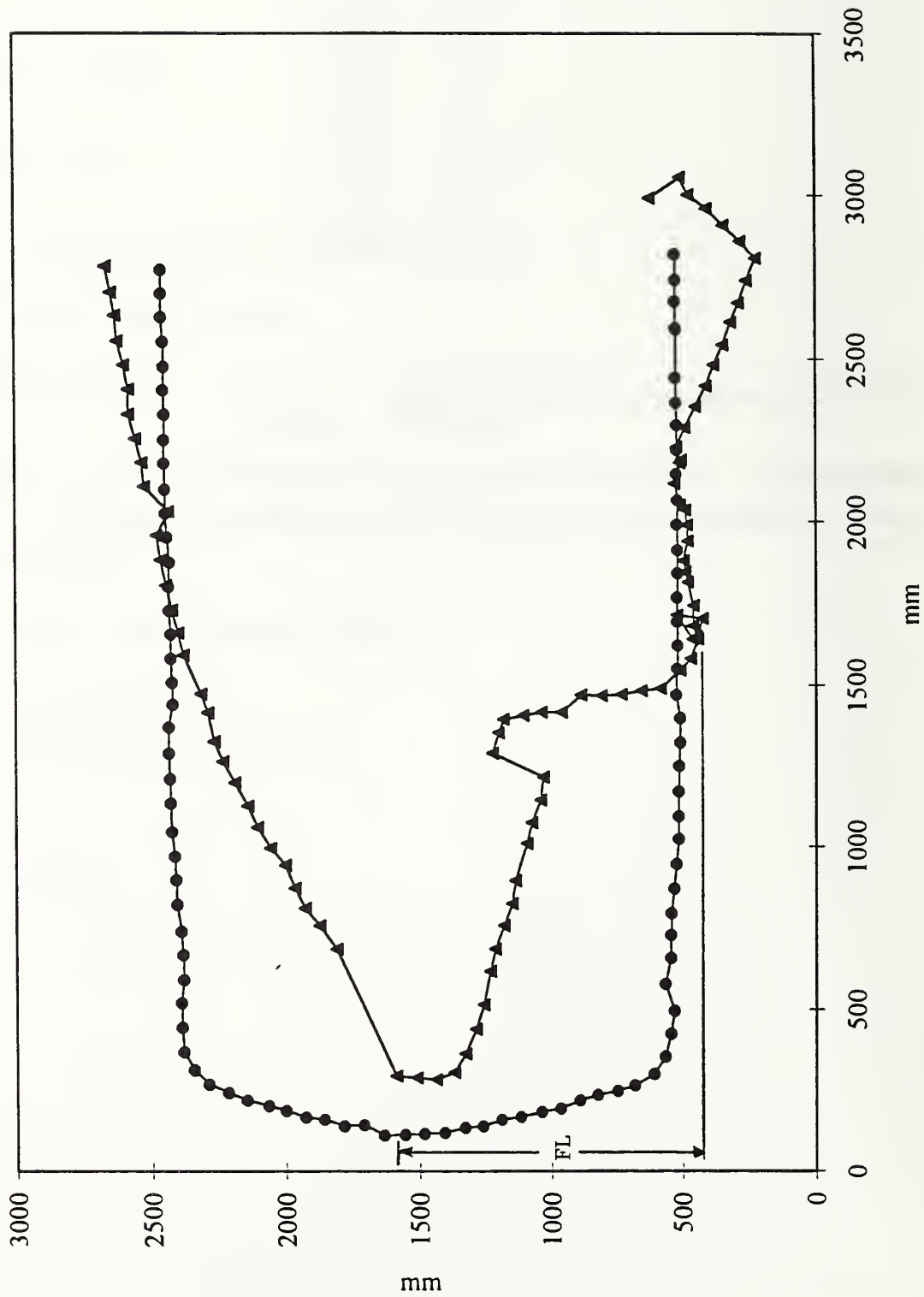


Table 25 Vehicle Measurements

Test No. 940613-5

Vehicle Make/Model: Chevrolet/Silverado

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4370	3785	585
X2	Rear Surface Of Vehicle To Front Of Engine Block	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X3	Rear Surface Of Vehicle To Firewall	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3461	3499	-38
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3356	2870	486
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3412	3410	2
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3334	2784	550
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2221	2276	-55
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2146	2102	44
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2229	2273	-44
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2157	2032	125
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	3384	3399	-15
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	3364	2845	519
X14	Rear Surface Of Vehicle To Firewall - Right Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X15	Rear Surface Of Vehicle To Firewall - Left Side	NA <sup>1</sup>	NA <sup>1</sup>	NA <sup>1</sup>
X16	Rear Surface Of Vehicle To Steering Wheel Center	2854	2400	454
X17	Center Of Steering Column To "A" Post	303	470	-167
X18	Center Of Steering Column To Headliner	455	721	-266
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	4914	4635	279
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4170	3455	715
X21	Length Of Engine Block	NA <sup>1</sup>	430	NA <sup>1</sup>

All distance measurements are in millimeters.

Table 26 Vehicle Accelerometer Locations And Data Summary

TEST NUMBER: 940613-5 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3340 mm	0 mm	764 mm				
LONGITUDINAL				6.7 g	@ 23.2 ms	73.3 g	@ 28.9 ms
LATERAL				32.1 g	@ 32.0 ms	60.4 g	@ 24.2 ms
VERTICAL				66.7 g	@ 15.3 ms	50.6 g	@ 30.4 ms
RESULTANT				87.8 g	@ 15.0 ms		
2 LEFT REAR SILL	2167 mm	690 mm	683 mm				
LONGITUDINAL				63.8 g	@ 32.2 ms	111.7 g	@ 19.2 ms
LATERAL				20.0 g	@ 43.8 ms	45.8 g	@ 30.4 ms
3 RIGHT REAR SILL	2210 mm	-690 mm	735 mm				
LONGITUDINAL				1.9 g	@ 193.6 ms	31.7 g	@ 29.3 ms
LATERAL				15.6 g	@ 39.1 ms	46.8 g	@ 31.0 ms

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER  
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE  
Z: + UPWARD FROM GROUND LEVEL

Table 27 Camera Information

Test No. 940613-5

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	17	1020	Impact overall
2	Right tight	Photosonic	13	1000	Impact overall
3	Overhead	Photosonic	13	1000	Impact overall



List Of Photographs

Test No. 940613-1

- A-1. Pre-Test Right Side View
- A-2. Post-Test Right Side View
- A-3. Pre-Test Right Front Three-Quarter View
- A-4. Post-Test Right Front Three-Quarter View
- A-5. Pre-Test Front View
- A-6. Post-Test Front View
- A-7. Pre-Test Left Front Three-Quarter View
- A-8. Post-Test Left Front Three-Quarter View
- A-9. Pre-Test Left Side View
- A-10. Post-Test Left Side View
- A-11. Pre-Test Rear View
- A-12. Post-Test Rear View





Figure A-1 Pre-Test Right Side View



Figure A-2 Post-Test Right Side View



Figure A-3 Pre-Test Right Front Three-Quarter View



Figure A-4 Post-Test Right Front Three-Quarter View



Figure A-5 Pre-Test Front View



Figure A-6 Post-Test Front View



Figure A-7 Pre-Test Left Front Three-Quarter View

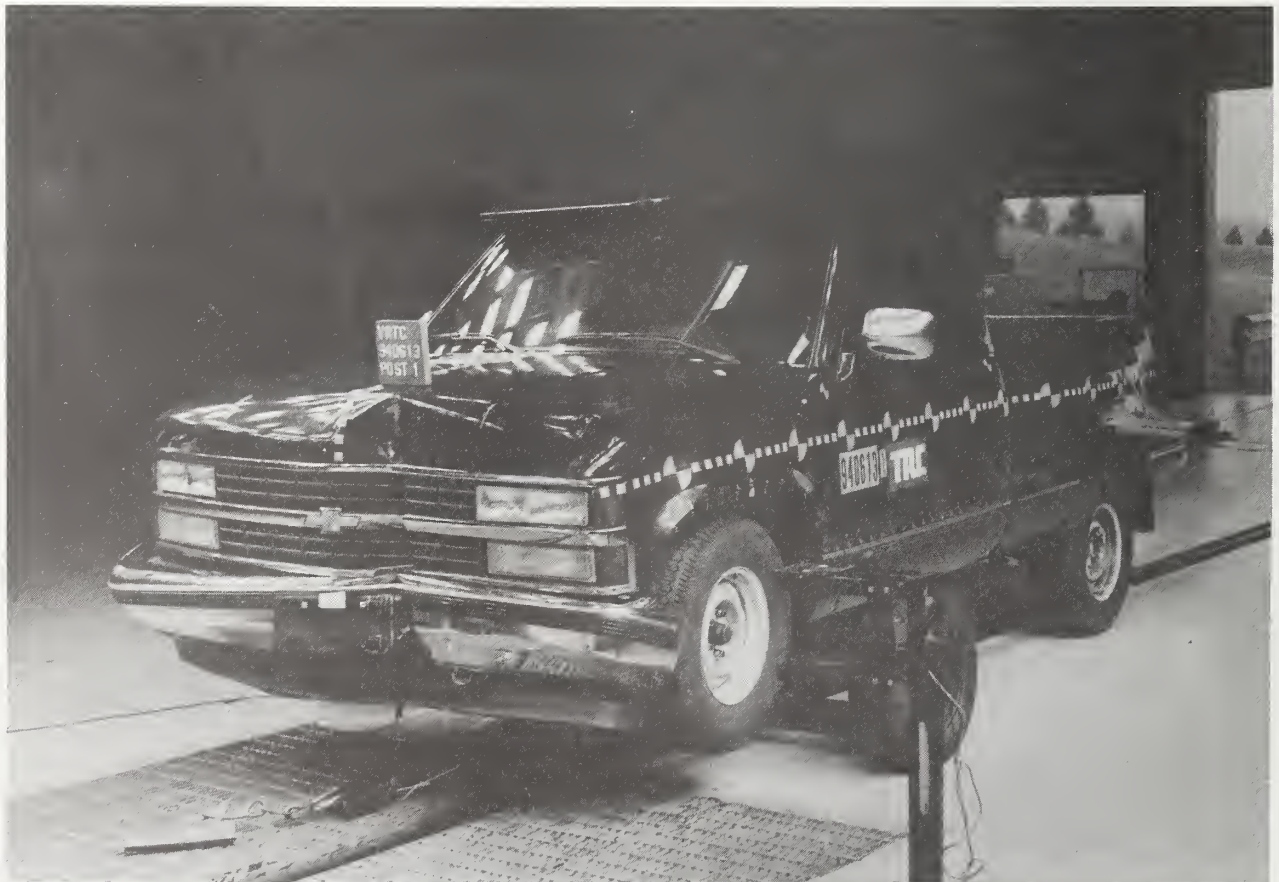


Figure A-8 Post-Test Left Front Three-Quarter View



Figure A-9 Pre-Test Left Side View



Figure A-10 Post-Test Left Side View

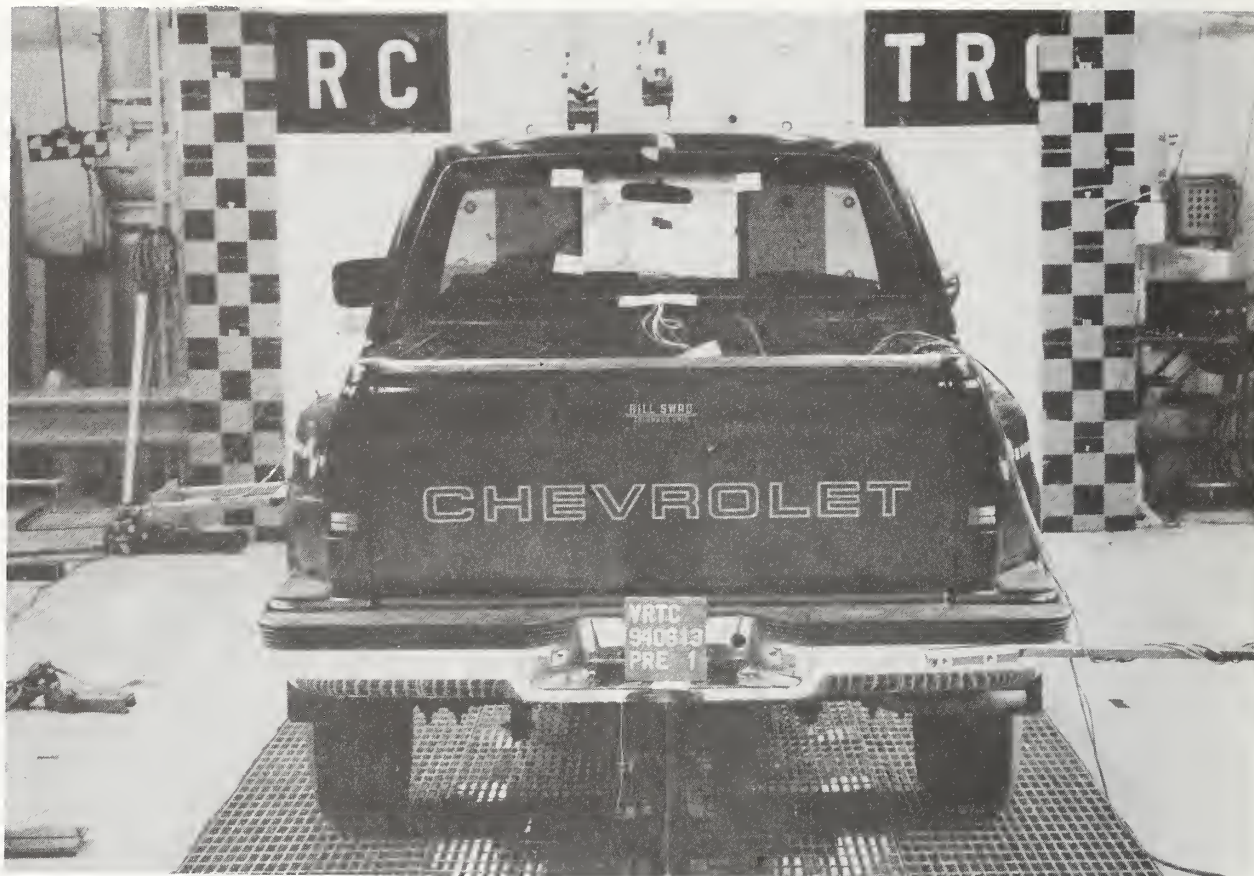


Figure A-11 Pre-Test Rear View

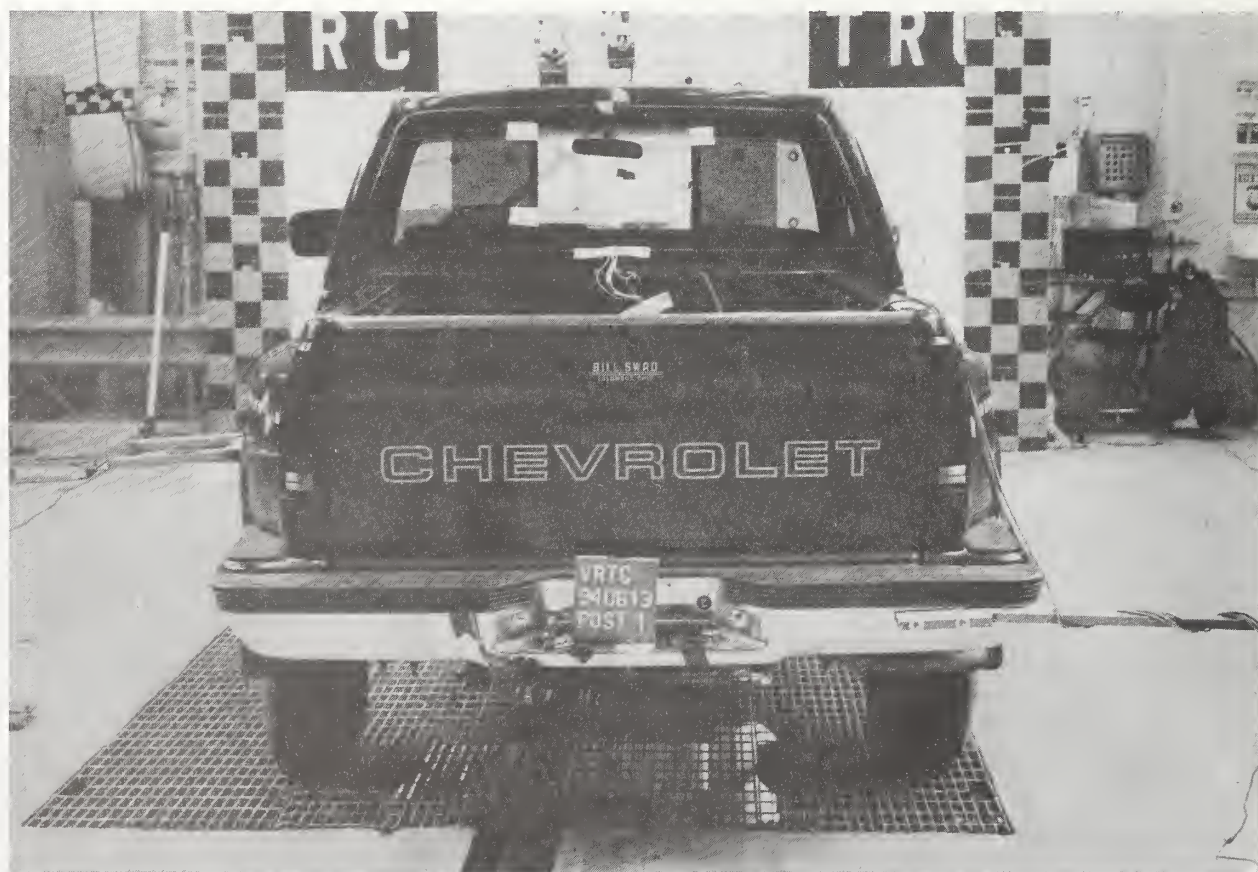


Figure A-12 Post-Test Rear View

List Of Photographs

Test No. 940613-2

A-13. Post-Test Right Side View

A-14. Post-Test Right Front Three-Quarter View

A-15. Post-Test Front View

A-16. Post-Test Left Front Three-Quarter View

A-17. Post-Test Left Side View

A-18. Post-Test Rear View





Figure A-13 Post-Test Right Side View



Figure A-14 Post-Test Right Front Three-Quarter View



Figure A-15 Post-Test Front View



Figure A-16 Post-Test Left Front Three-Quarter View



Figure A-17 Post-Test Left Side View



Figure A-18 Post Test Rear View



List Of Photographs

Test No. 940613-3

A-19. Post-Test Right Side View

A-20. Post-Test Right Front Three-Quarter View

A-21. Post-Test Front View

A-22. Post-Test Left Front Three-Quarter View

A-23. Post-Test Left Side View

A-24. Post-Test Rear View





Figure A-19 Post-Test Right Side View



Figure A-20 Post-Test Right Front Three-Quarter View



Figure A-21 Post-Test Front View



Figure A-22 Post-Test Left Front Three-Quarter View



Figure A-23 Post-Test Left Side View



Figure A-24 Post Test Rear View



List Of Photographs

Test No. 940613-4

A-25. Post-Test Right Side View

A-26. Post-Test Right Front Three-Quarter View

A-27. Post-Test Front View

A-28. Post-Test Left Front Three-Quarter View

A-29. Post-Test Left Side View

A-30. Post-Test Rear View



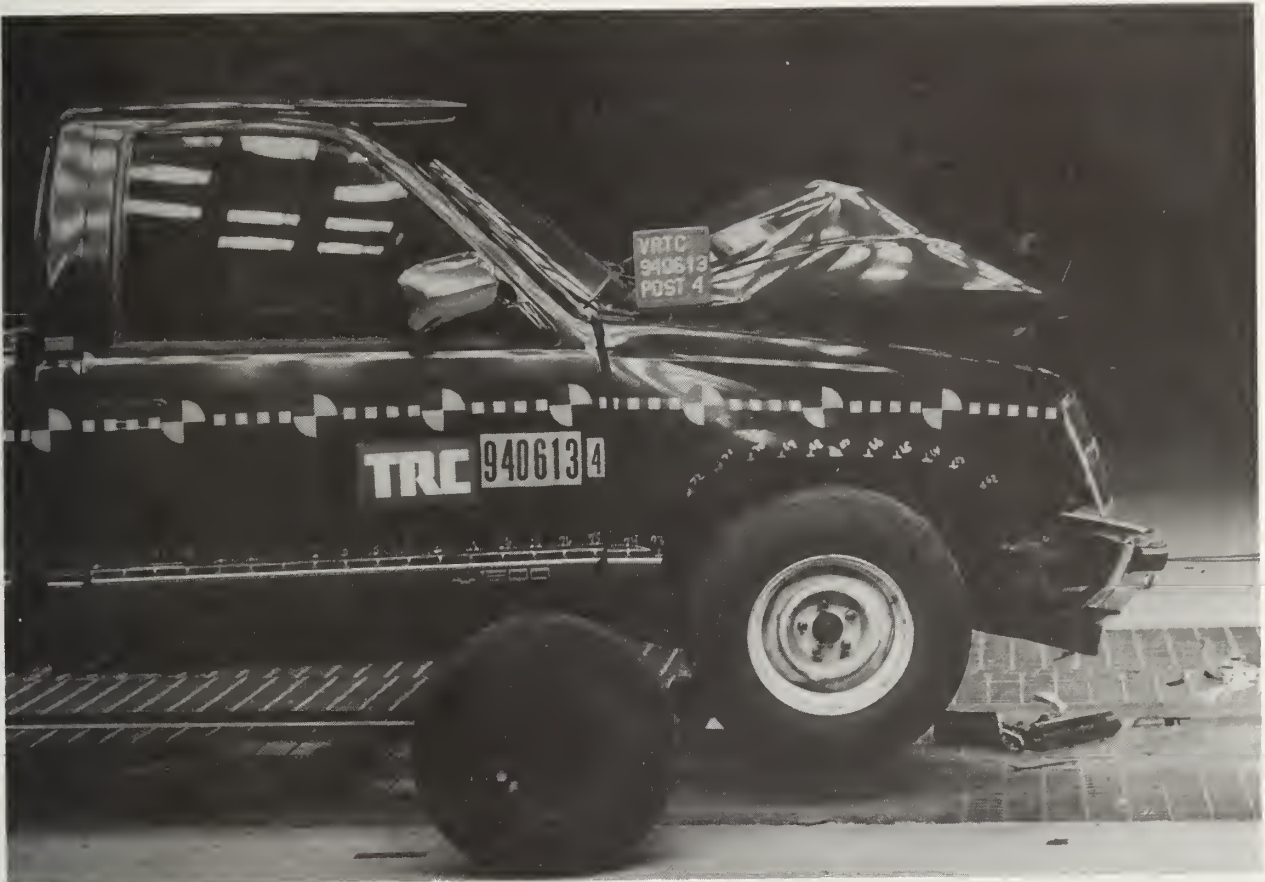


Figure A-25 Post-Test Right Side View



Figure A-26 Post-Test Right Front Three-Quarter View



Figure A-27 Post-Test Front View



Figure A-28 Post-Test Left Front Three-Quarter View



Figure A-29 Post-Test Left Side View



Figure A-30 Post-Test Rear View



List Of Photographs

Test No. 940613-5

- A-31. Post-Test Right Side View
- A-32. Post-Test Right Front Three-Quarter View
- A-33. Post-Test Front View
- A-34. Post-Test Left Front Three-Quarter View
- A-35. Post-Test Left Side View
- A-36. Post-Test Rear View



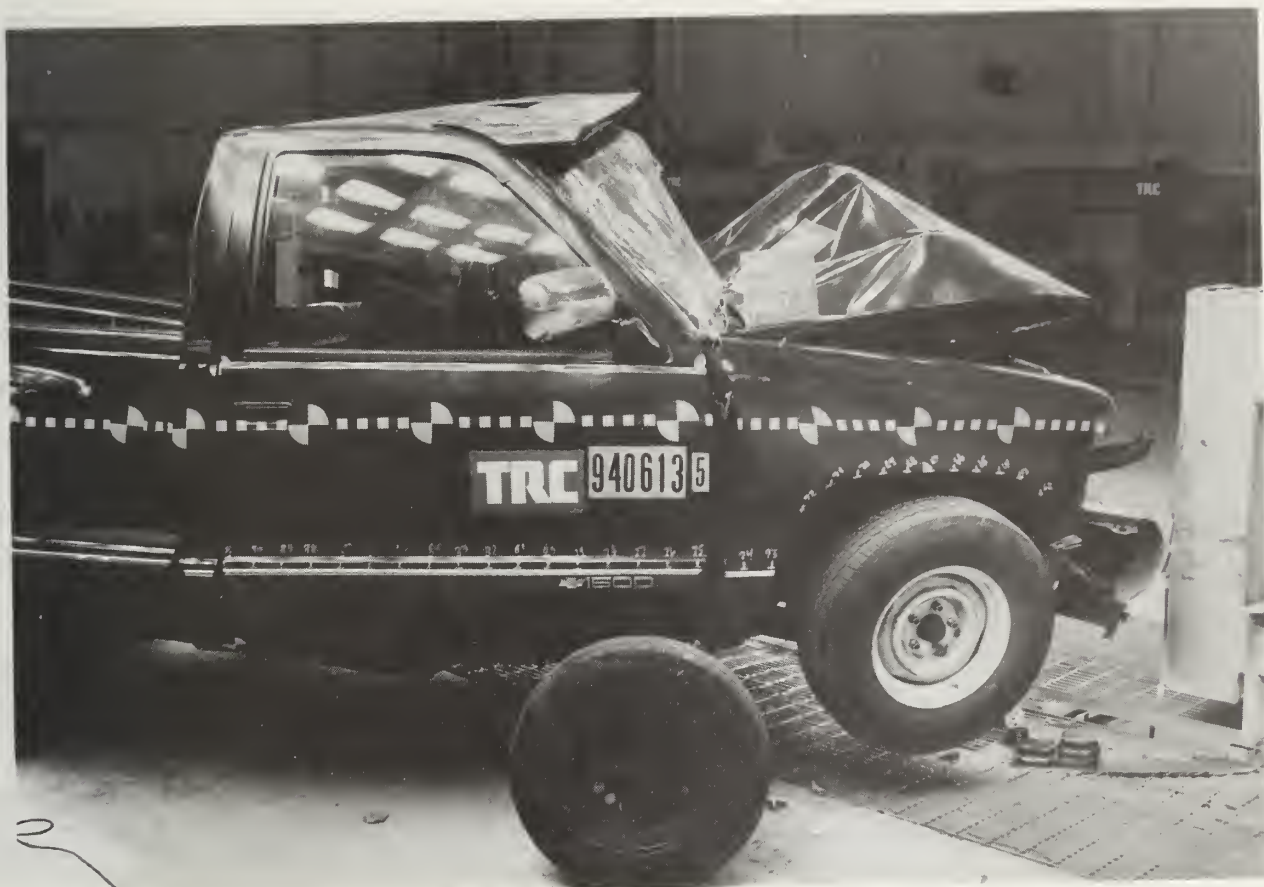


Figure A-31 Post-Test Right Side View



Figure A-32 Post-Test Right Front Three-Quarter View



Figure A-33 Post-Test Front View



Figure A-34 Post-Test Left Front Three-Quarter View



Figure A-35 Post-Test Left Side View



Figure A-36 Post-Test Rear View



Data Plots

Test No. 940613-1



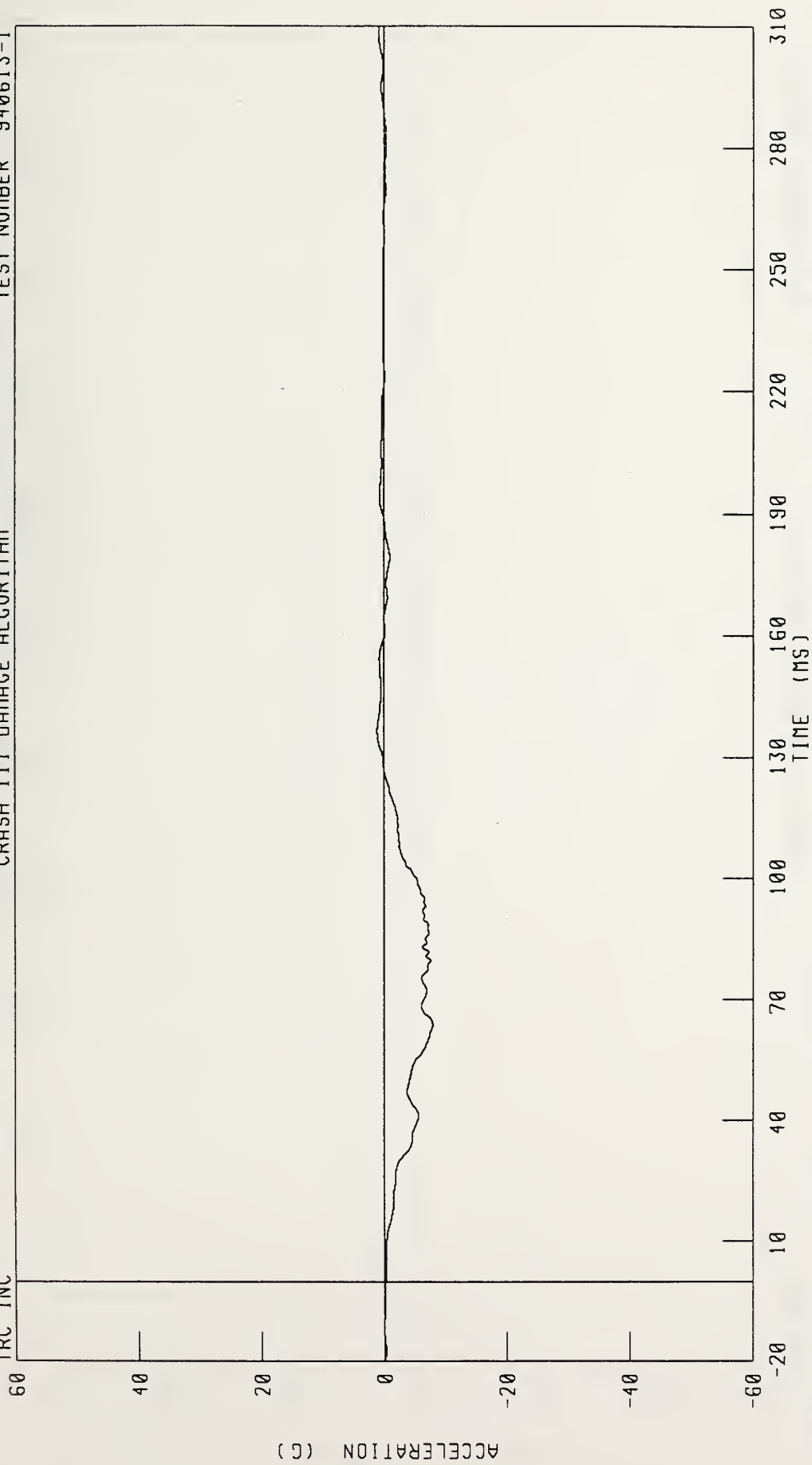
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL VCGXG1 FILTER CH CLASS 60

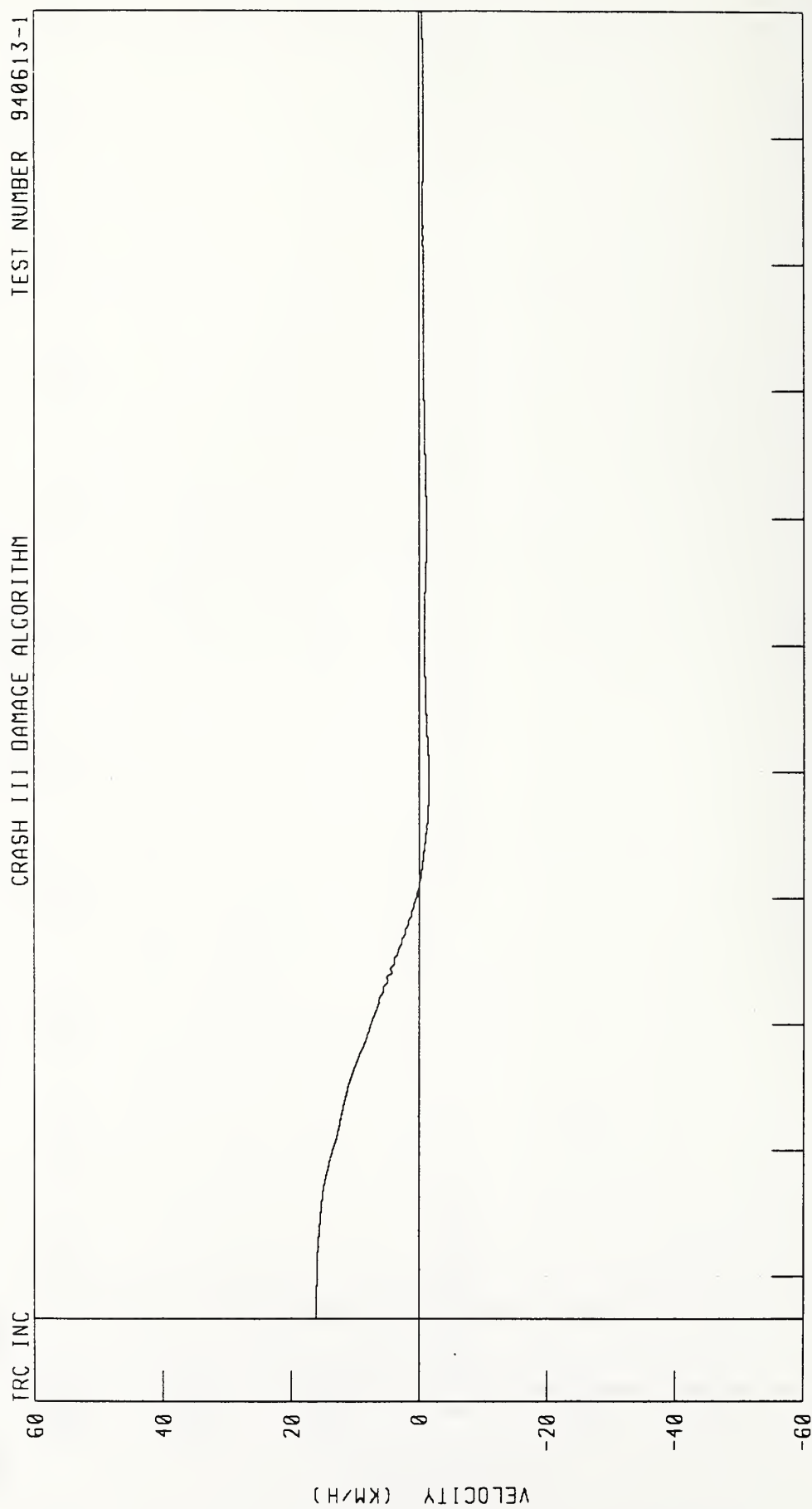
PEAK DATA 1 14 G @ 136 40 MS, -7 88 G @ 63 76 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



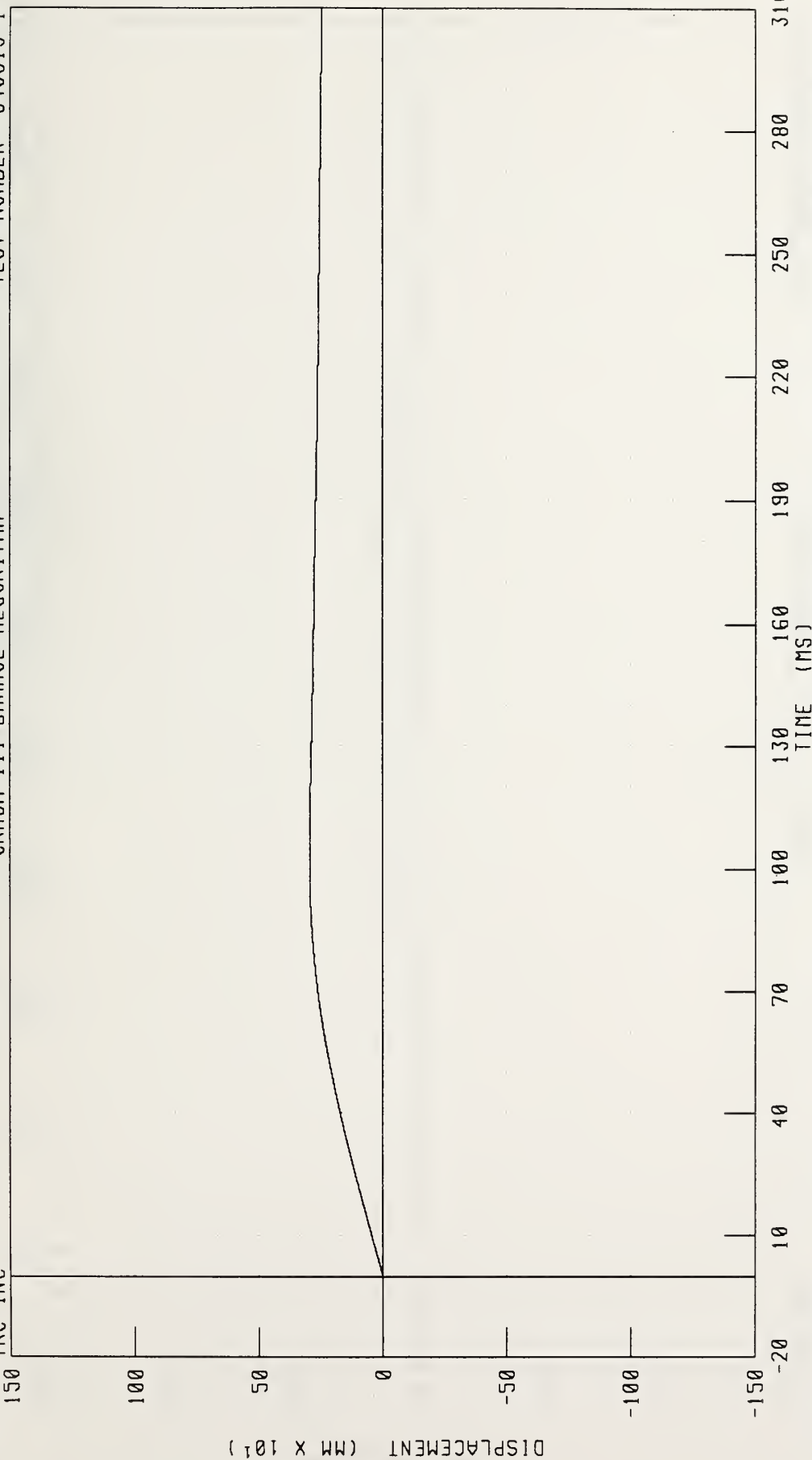
TIME (MS)

CHANNEL VCGXV1 FILTER CH CLASS 180 PEAK DATA 16.10 KM/H @ 0.00 MS, -1.52 KM/H @ 127.04 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG X-AXIS DISPLACEMENT  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL VCGXD1 FILTER CH CLASS 180

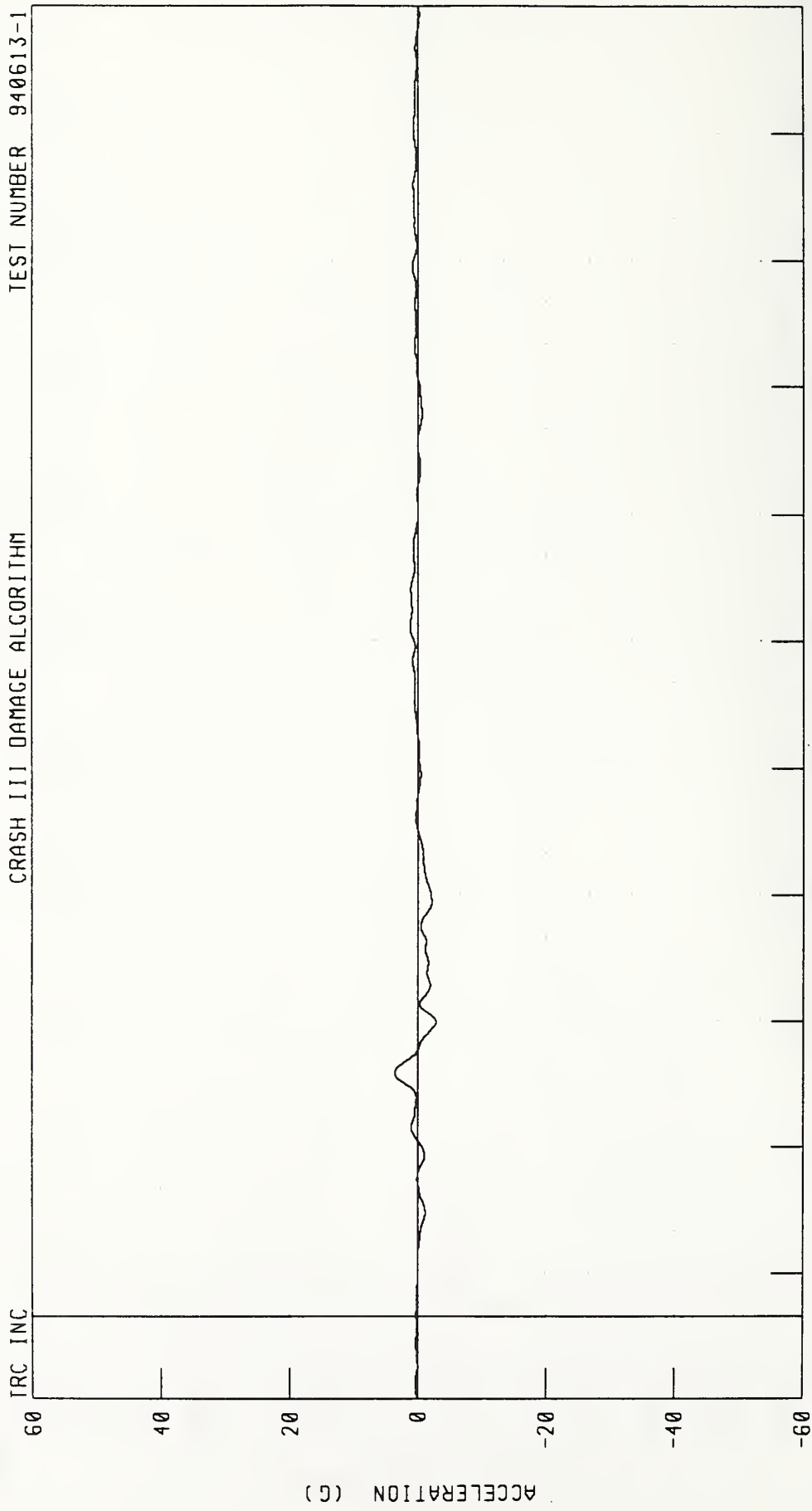
PEAK DATA 294 13 MM @ 103 76 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



CHANNEL VCGYG1 FILTER CH CLASS 60

TIME (MS)

PEAK DATA 3.61 G @ 57.60 MS, -2.83 G @ 69.92 MS

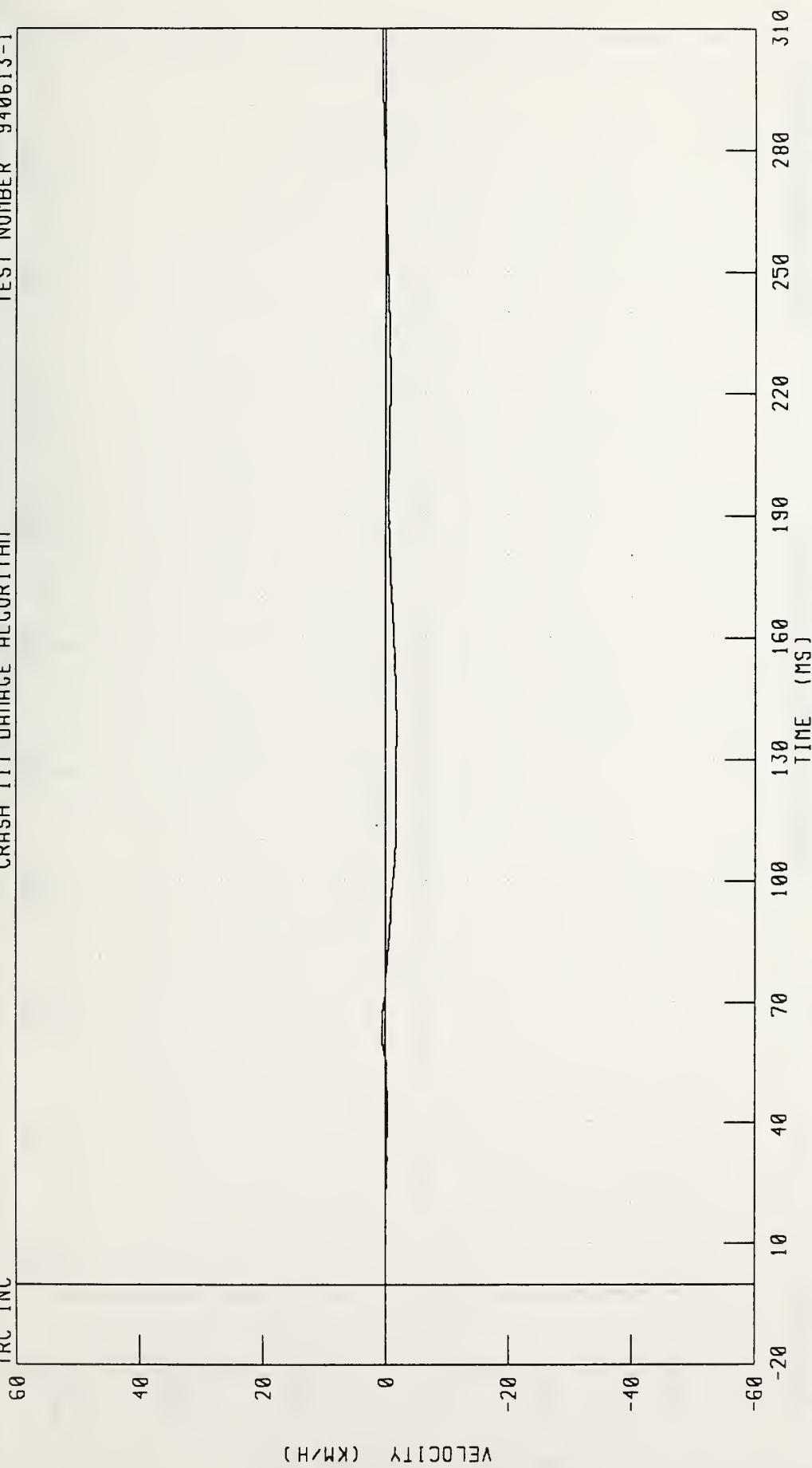
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL VCGYV1 FILTER: CH CLASS 180

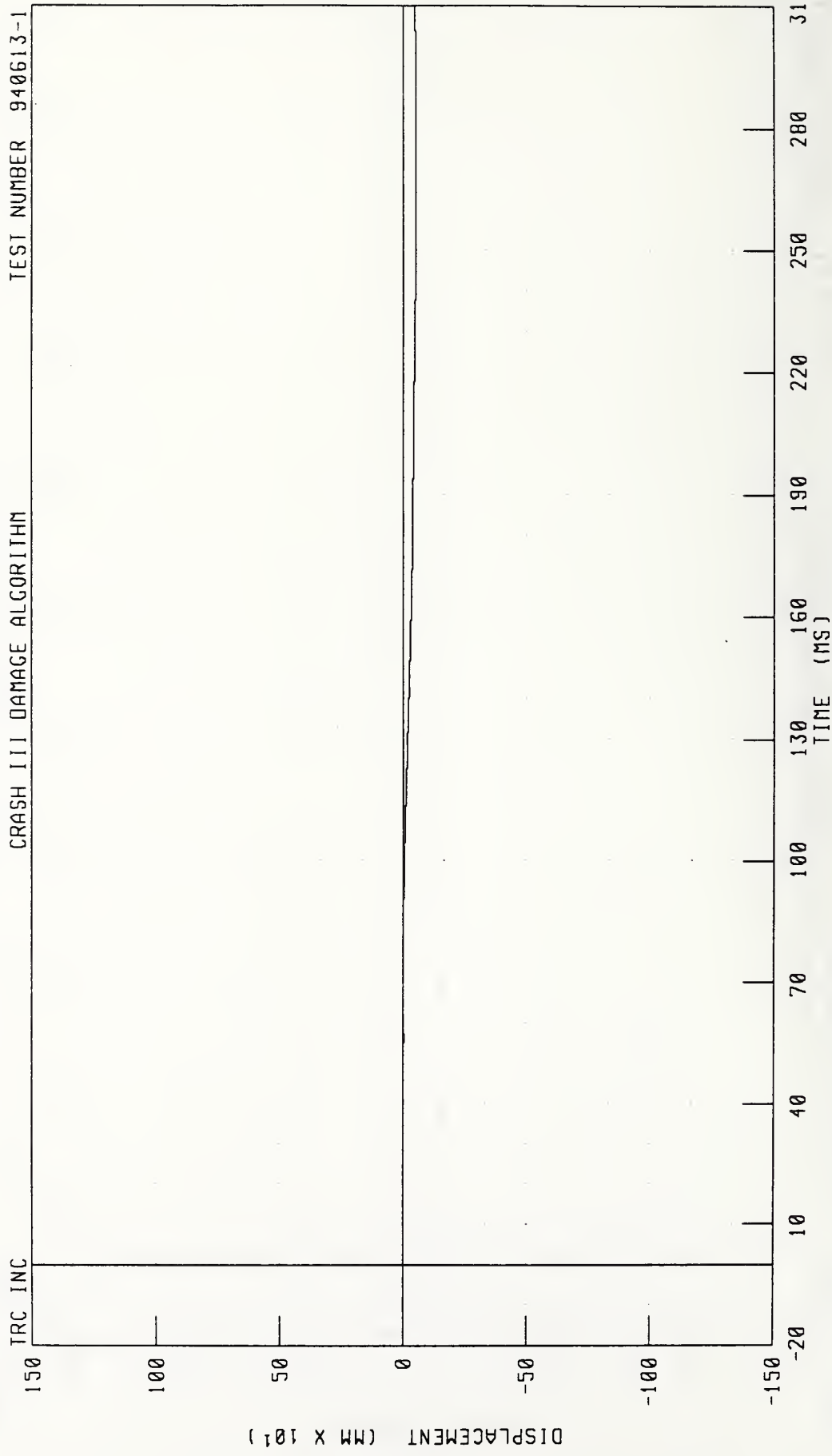
PEAK DATA 0 57 KM/H @ 304 64 MS; -1 80 KM/H @ 137 12 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



CHANNEL VCGYD1 FILTER CH CLASS 180

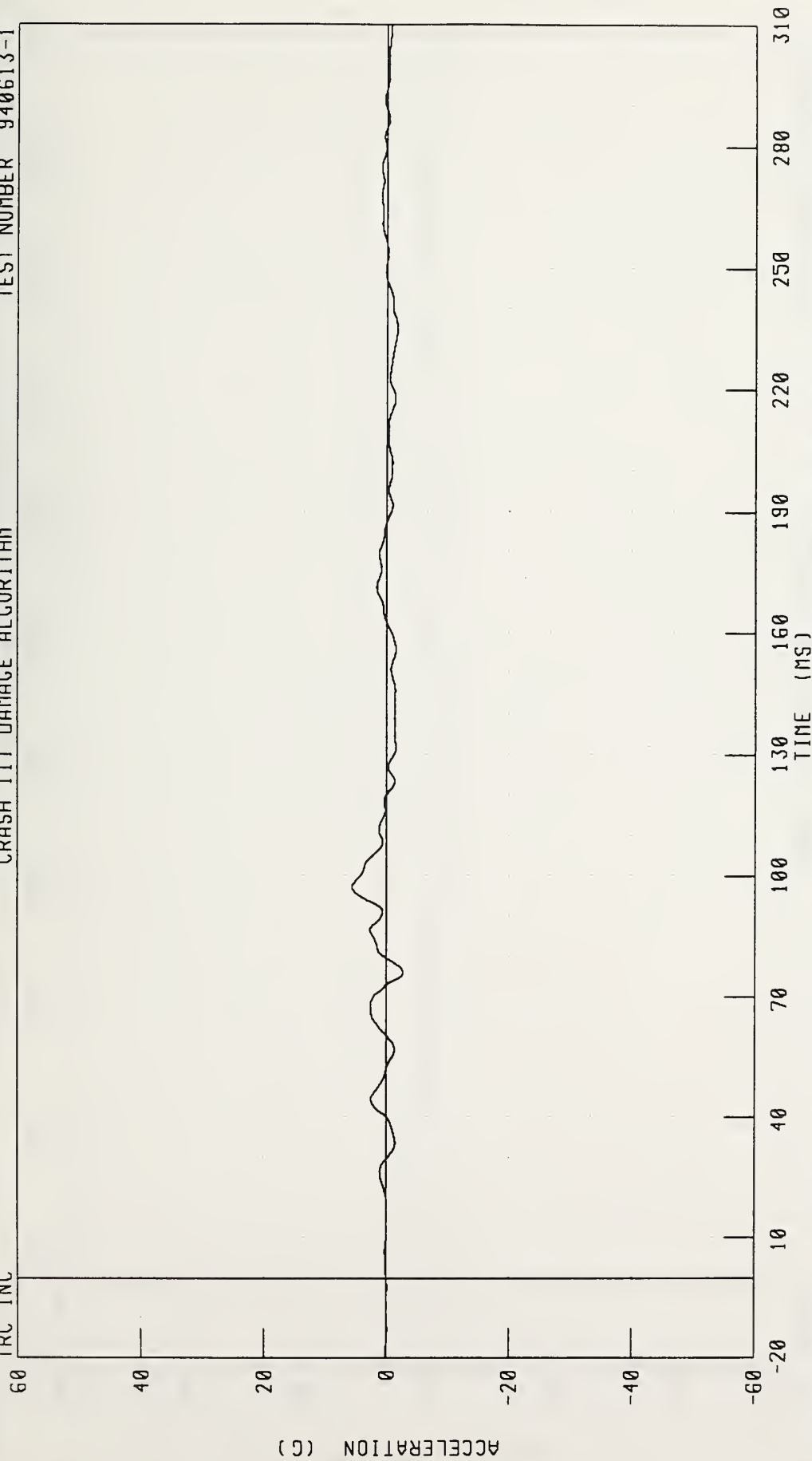
PEAK DATA: 0 24 MM @ 21.36 MS, -51 28 MM @ 268.96 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL VCGZG1 FILTER: CH CLASS 60

PEAK DATA: 5 60 G @ 97.20 MS; -2 64 G @ 76 08 MS

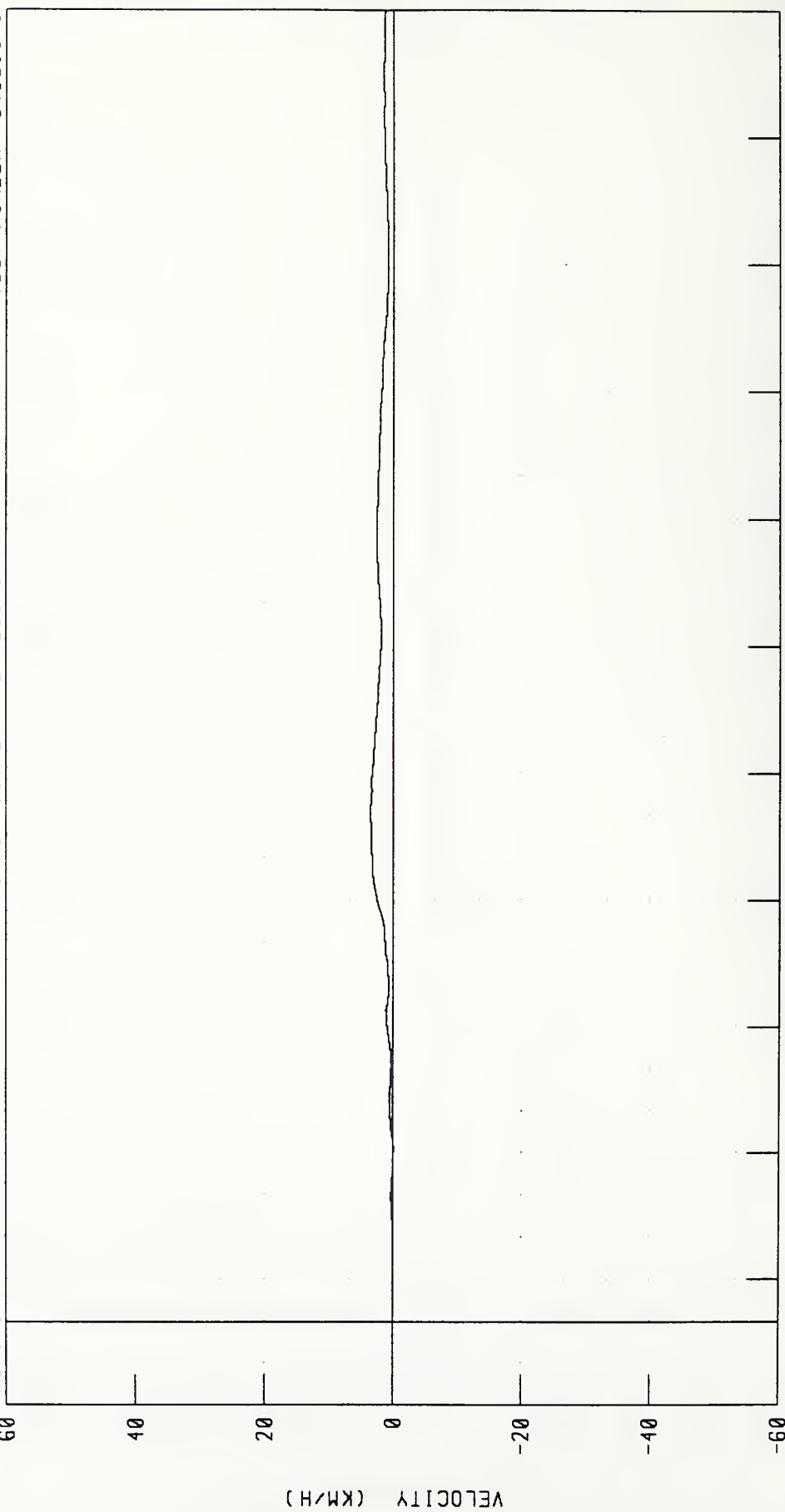
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

IRC INC



TIME (MS)

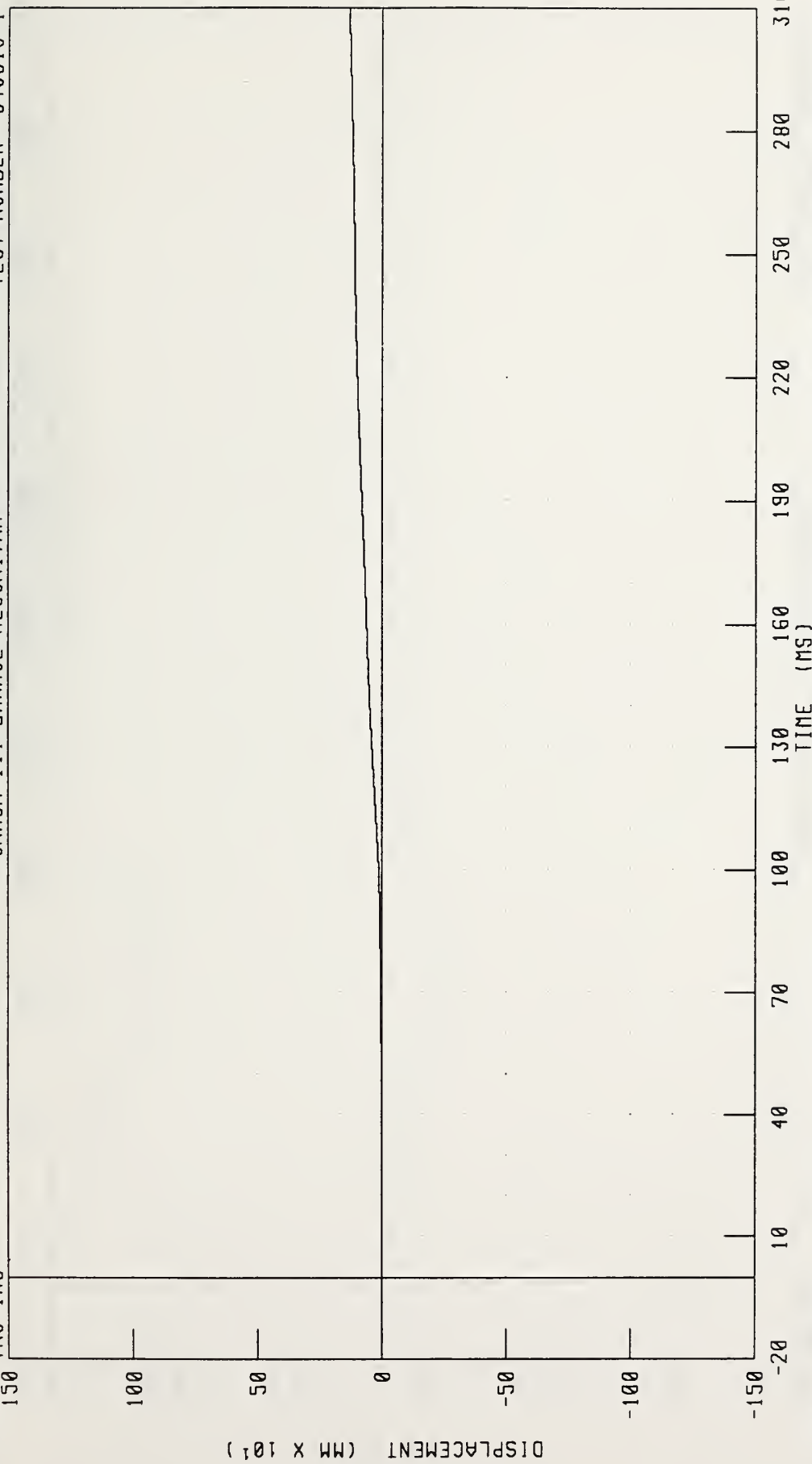
CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 3 54 KM/H @ 120 48 MS, -0 10 KM/H @ 40 96 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-1

TRC INC



CHANNEL VCGZ01 FILTER CH. CLASS 180

PEAK DATA

TIME (MS)

131.71 MM @ 310.00 MS, 0.00 MM @ 0.00 MS

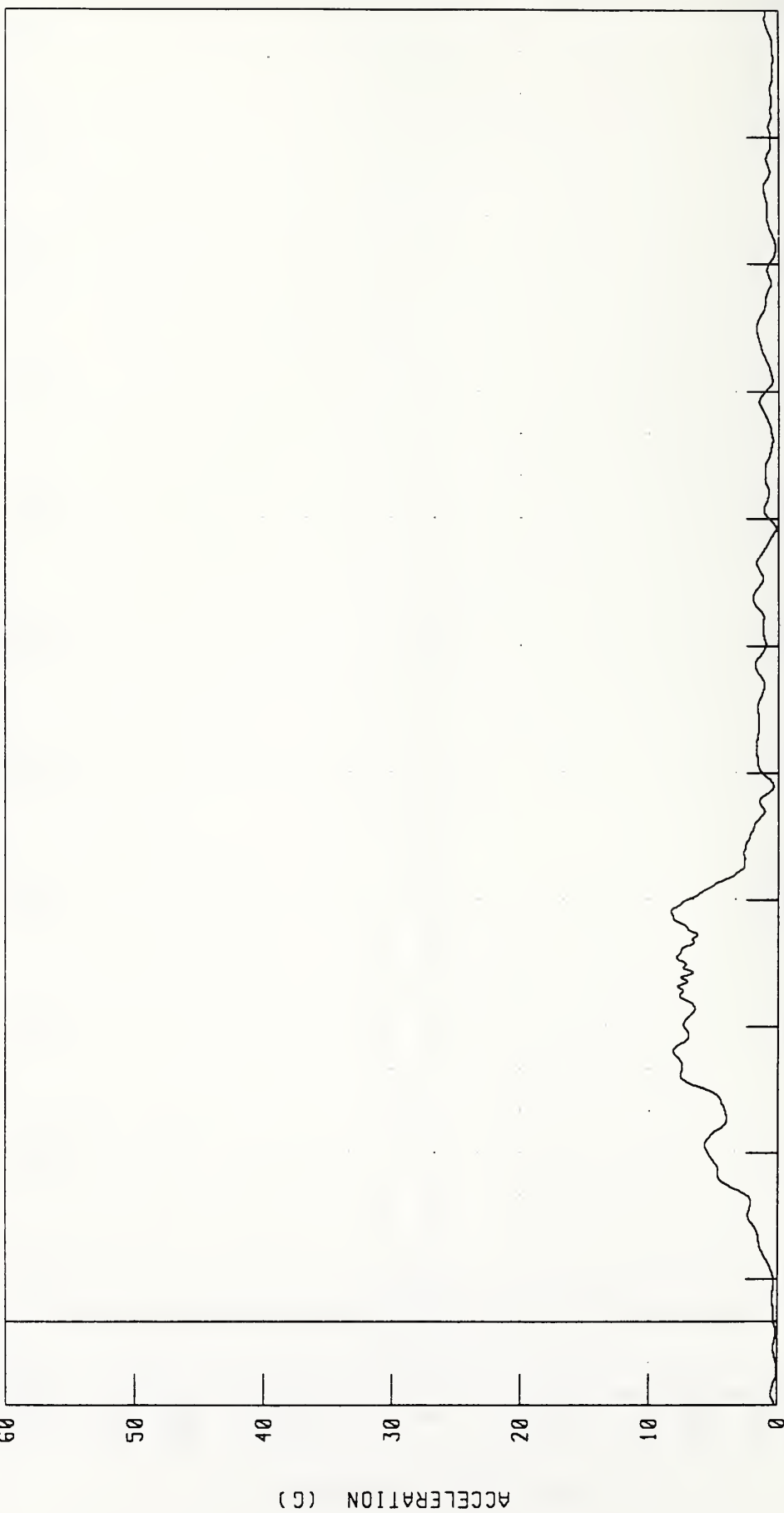
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG RESULTANT ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL VCGR1 FILTER CH CLASS 60

PEAK DATA 8 35 G @ 97.28 MS, 0.10 G @ -12.00 MS

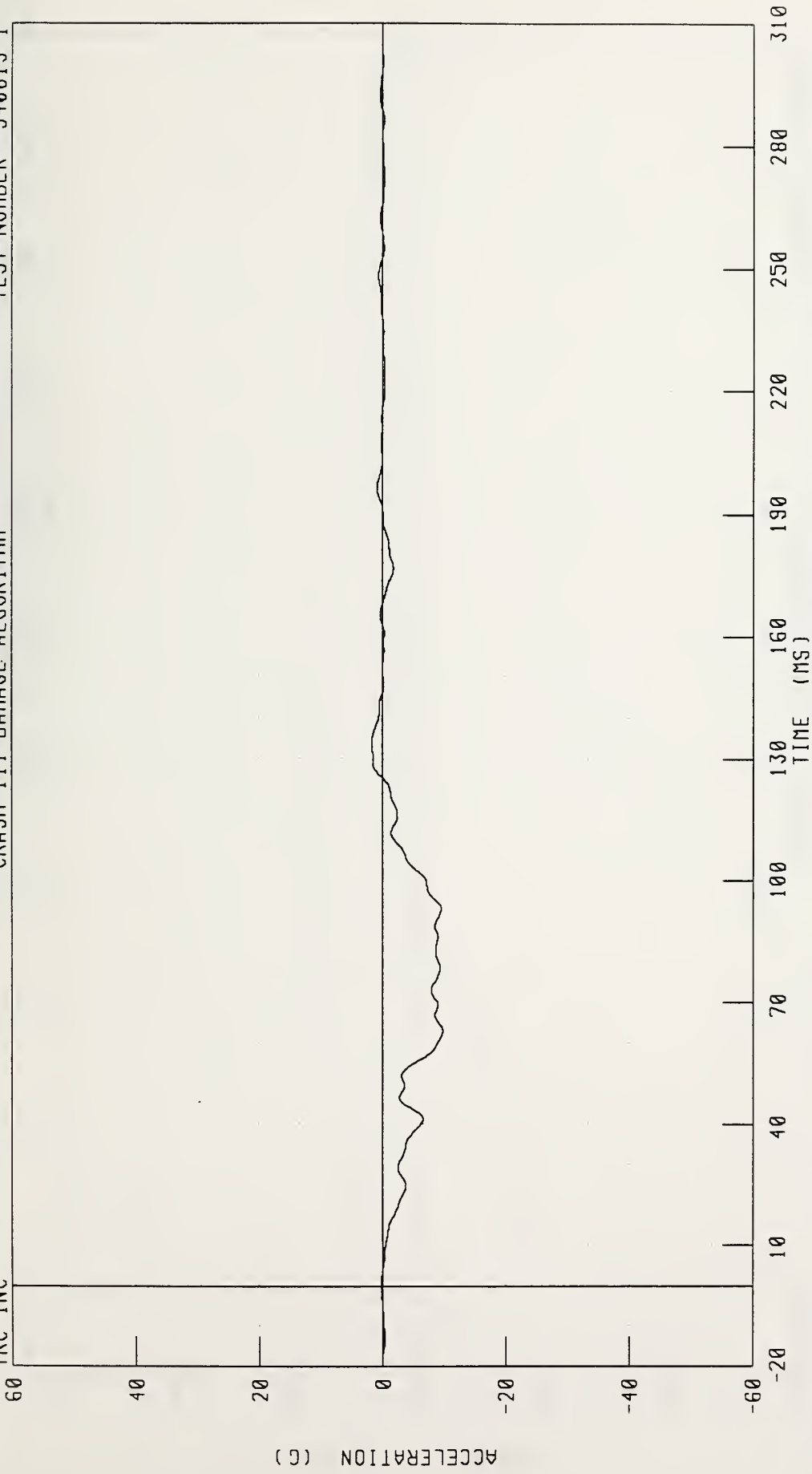
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL LRSXG1 FILTER CH CLASS 60

PEAK DATA 1 75 G @ 133 60 MS, -9 76 G @ 62 96 MS

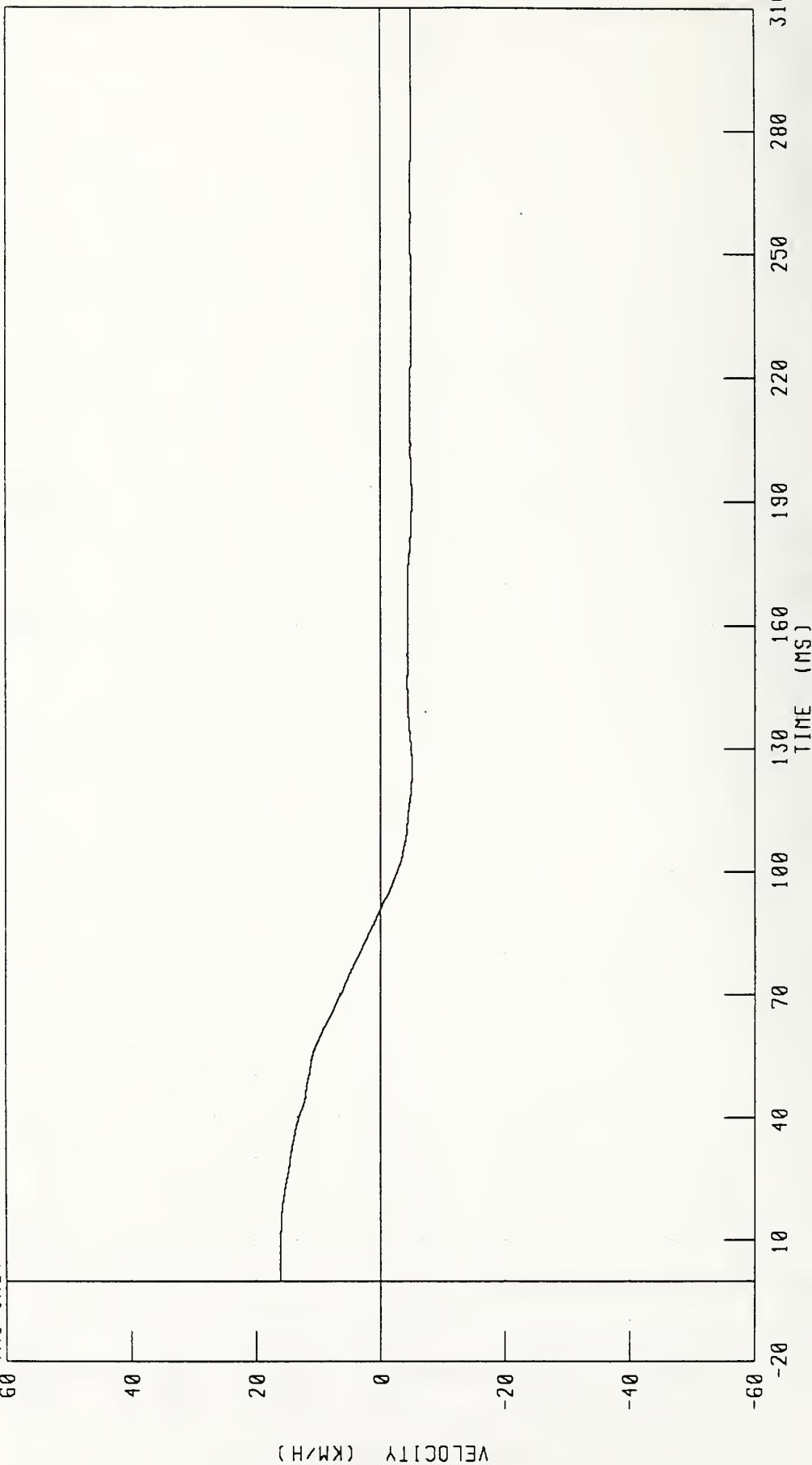
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS VELOCITY

TEST NUMBER 940613-1

CRASH III DAMAGE ALGORITHM

TRC INC



CHANNEL LRSXV1 FILTER CH CLASS 180

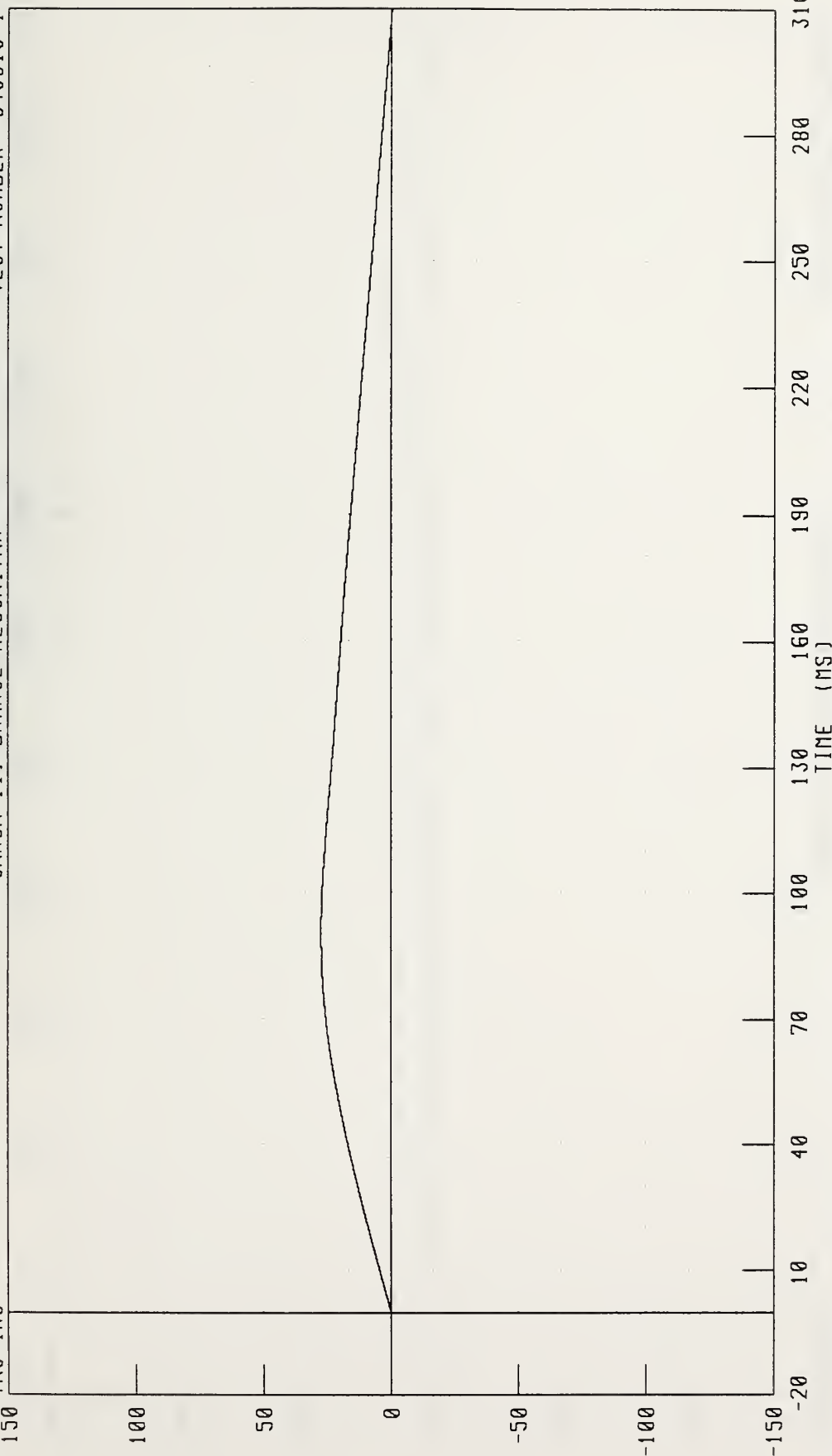
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC

DISPLACEMENT (MM X 10<sup>1</sup>)



CHANNEL LRSXD1 FILTER CH CLASS 180

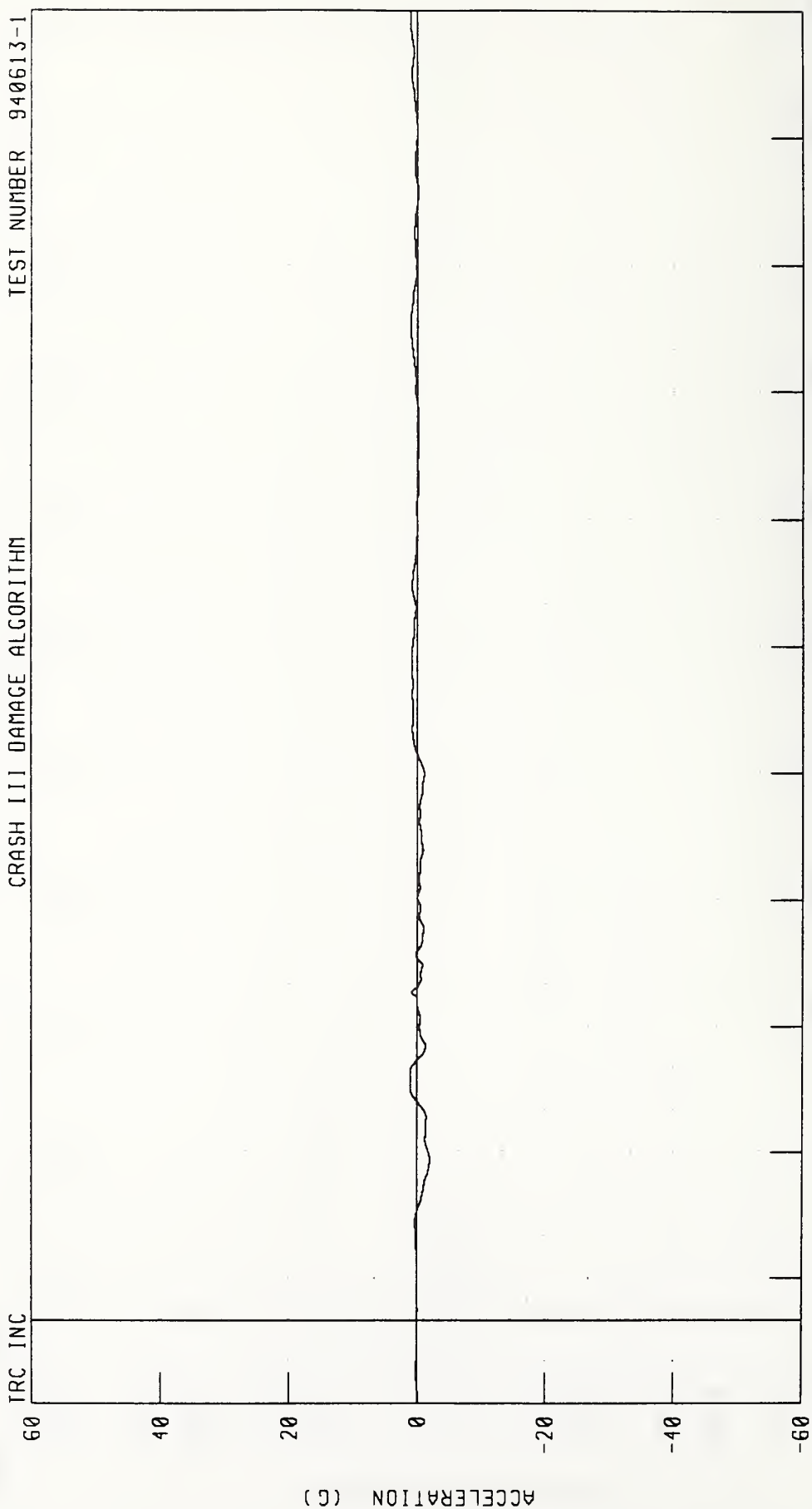
PEAK DATA: 273 95 MM @ 90 88 MS, -2 97 MM @ 310 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



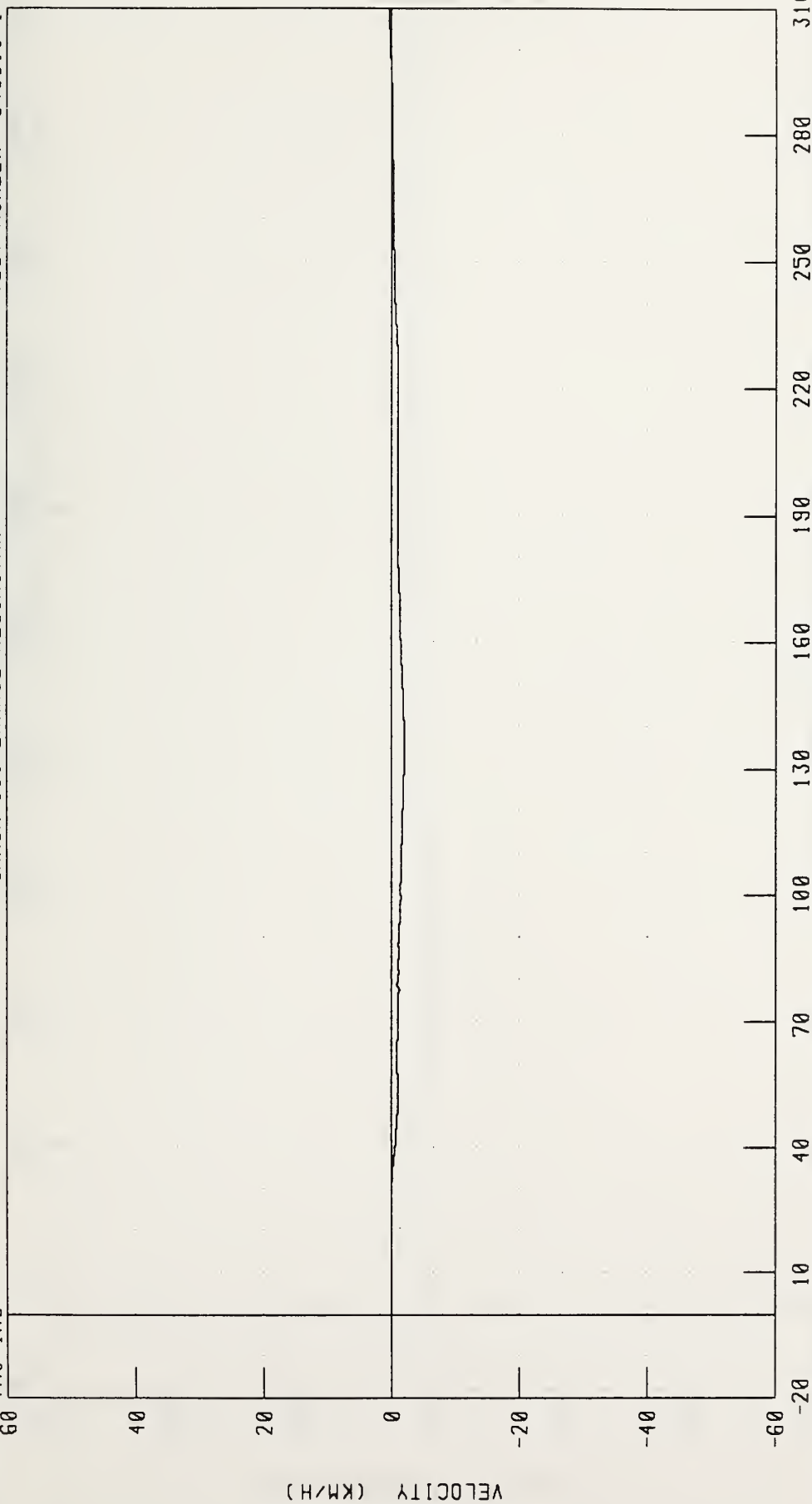
CHANNEL: LRSYG1 FILTER: CH CLASS 60

PEAK DATA: 1 09 G @ 58 88 MS, -1 99 G @ 38 16 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS VELOCITY  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC

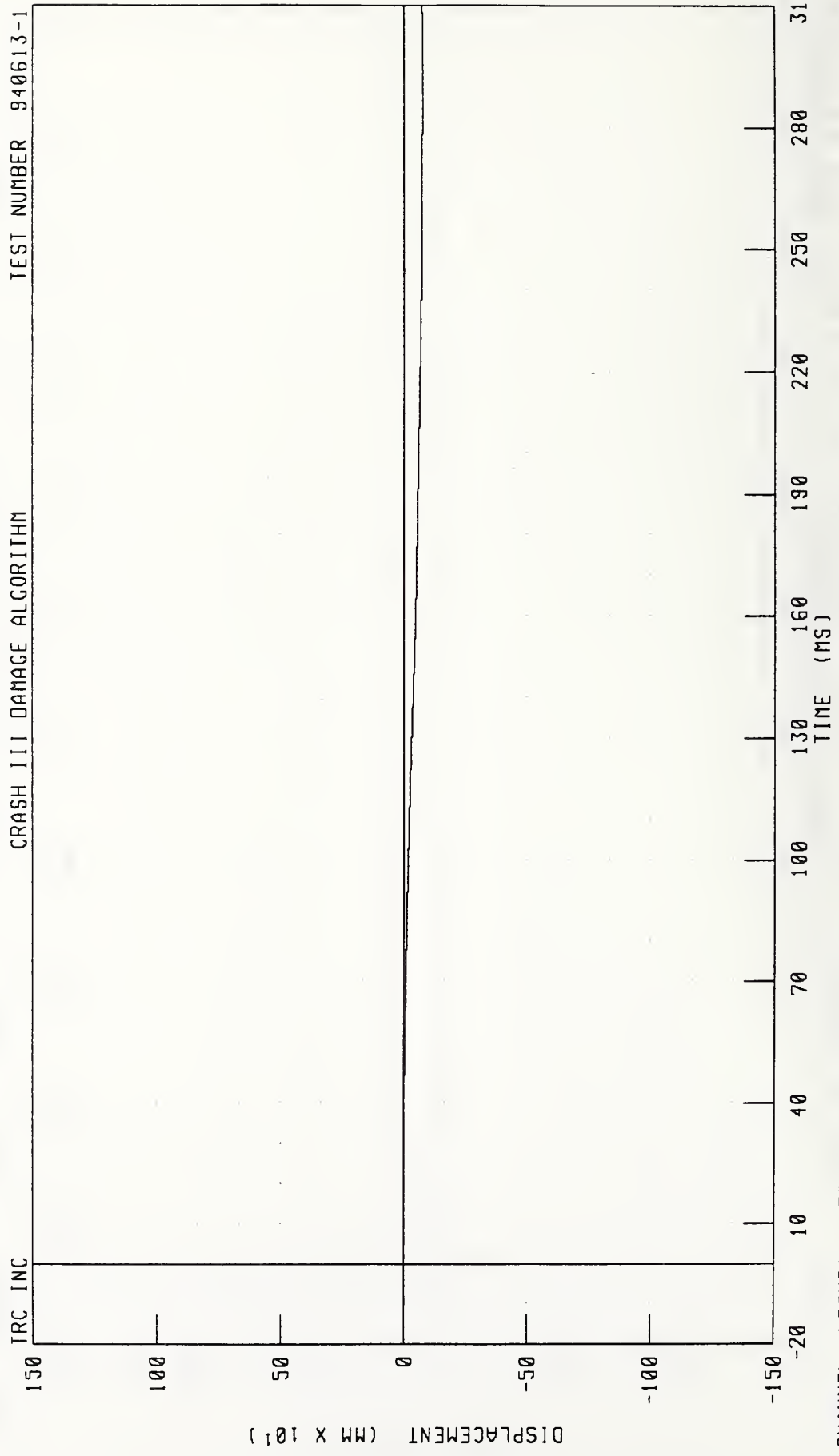


CHANNEL LRSYV1 FILTER CH. CLASS 180

PEAK DATA 0.43 KM/H @ 310.00 MS, -2.10 KM/H @ 134.32 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-1



CHANNEL LRSYD1 FILTER CH CLASS 180 PEAK DATA: 0 08 MM @ 30.32 MS, -74.38 MM @ 294.56 MS

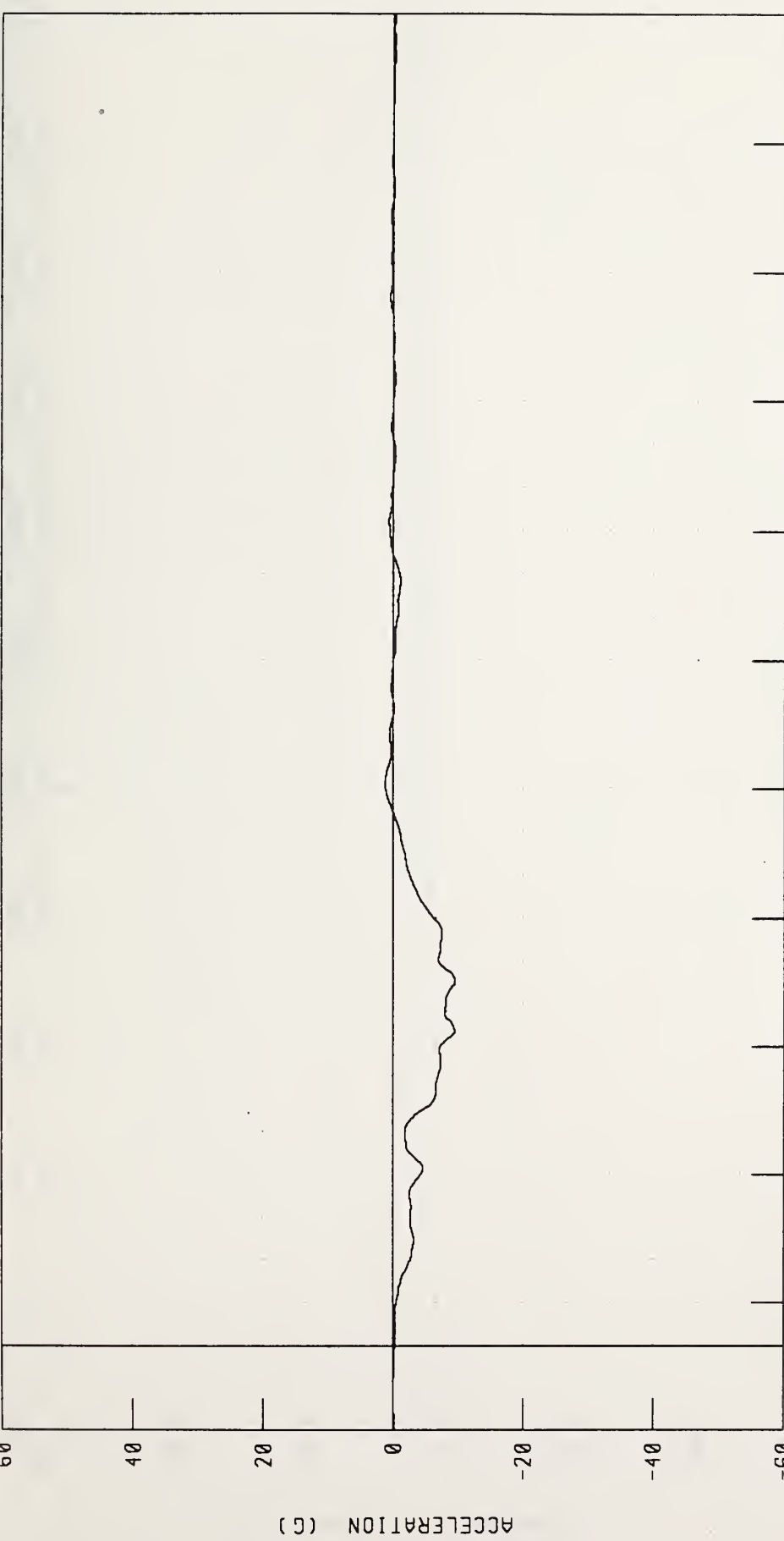
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL: RRSXG1 FILTER: CH CLASS 60

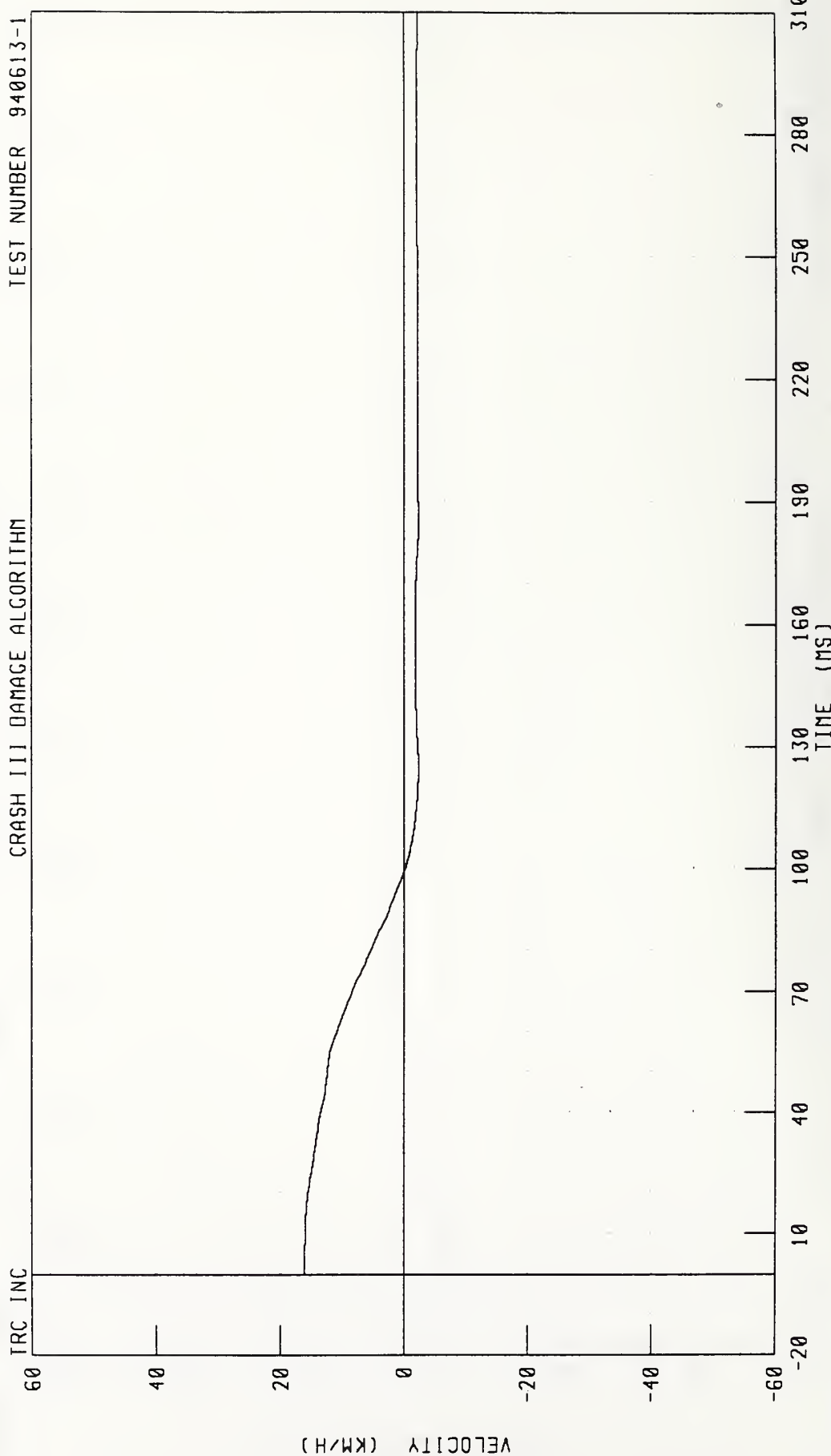
PEAK DATA 1.22 G @ 131.92 MS, -9.54 G @ 85.44 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



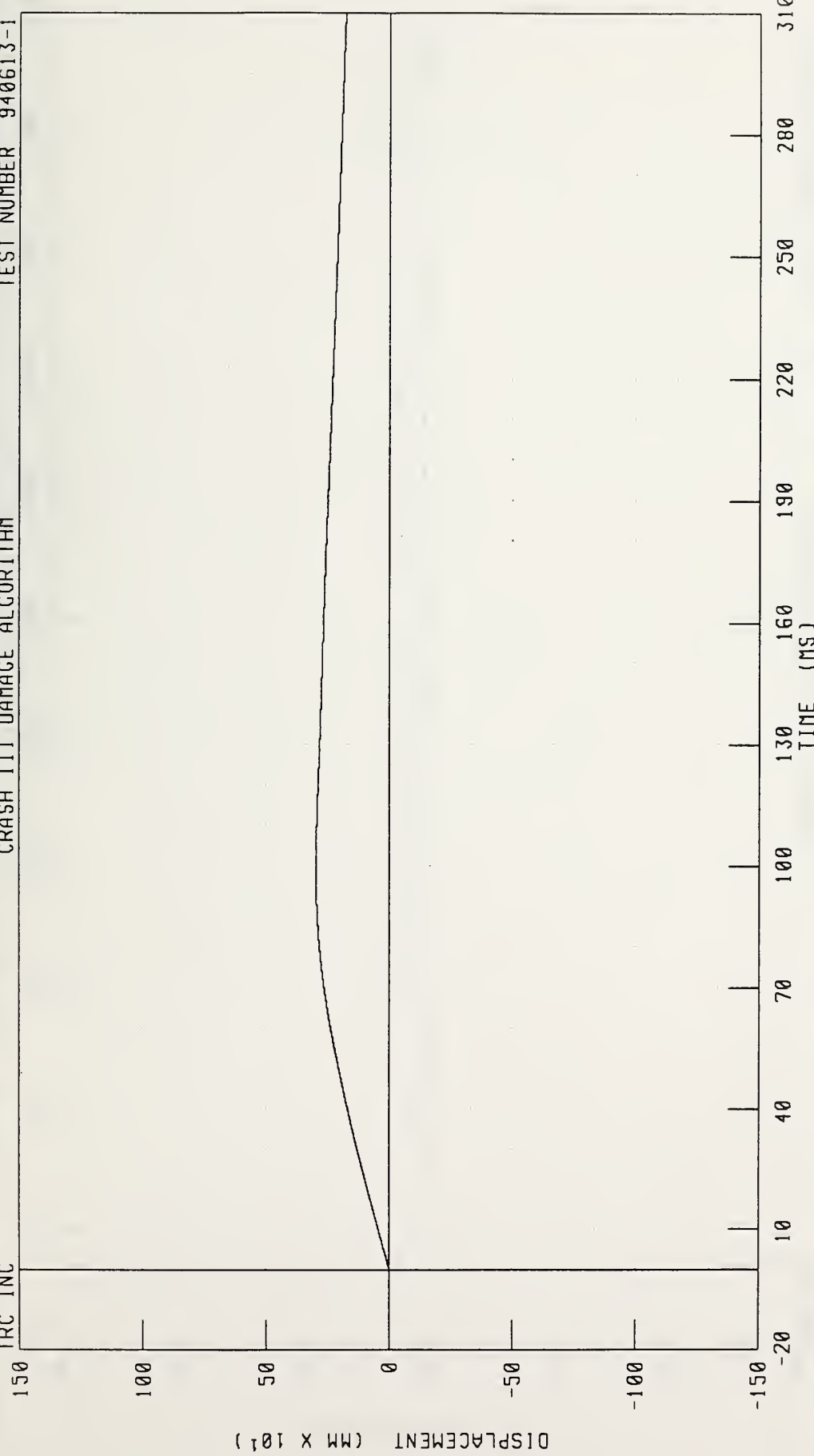
CHANNEL: RRSXV1 FILTER: CH CLASS 180

PEAK DATA: 16.10 KM/H @ 0.00 MS, -2.34 KM/H @ 183.44 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-1

TRC INC



CHANNEL RRSXD1 FILTER CH CLASS 180

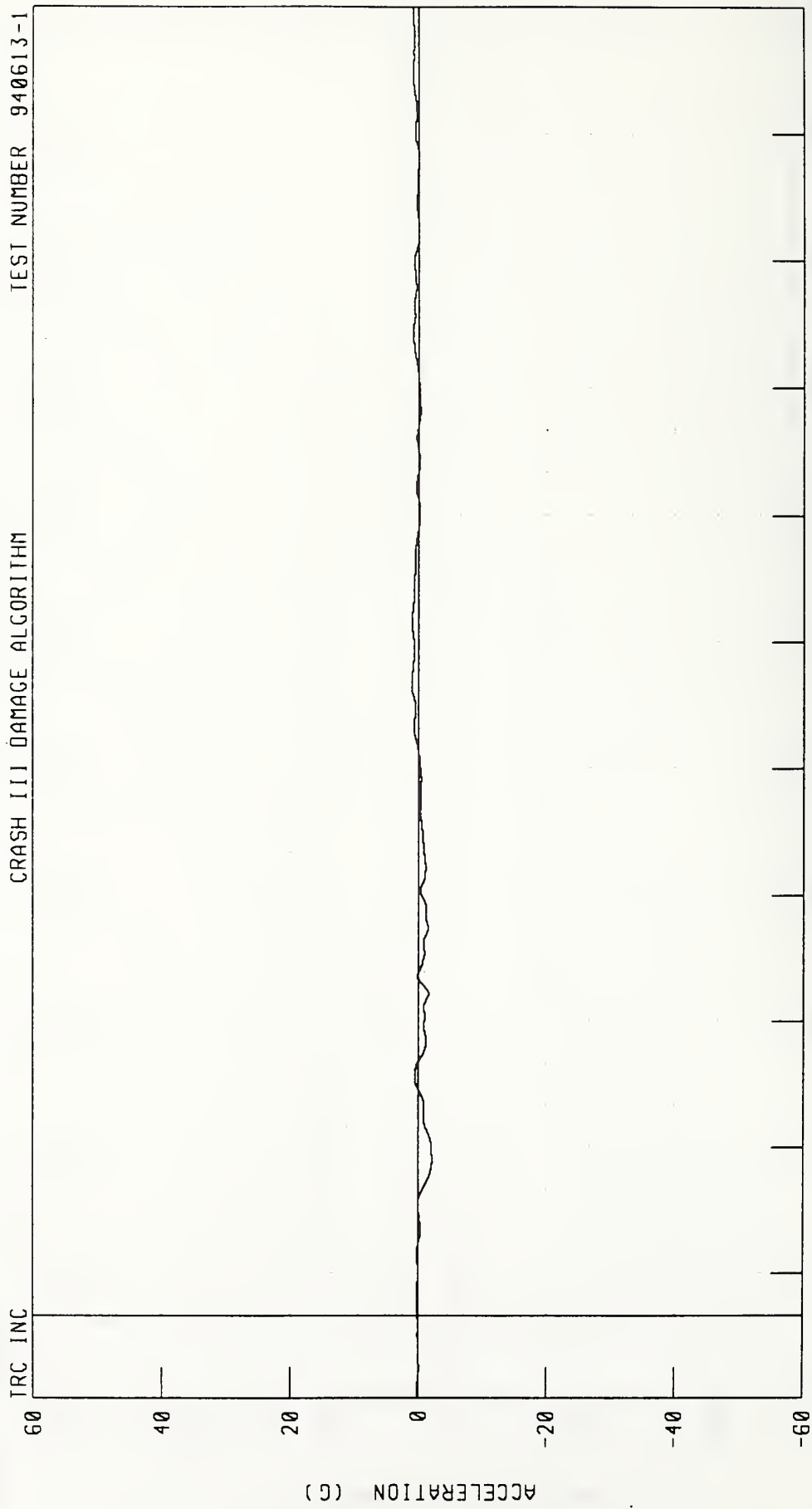
PEAK DATA 297 19 MM @ 99 28 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



CHANNEL RRSYG1 FILTER CH CLASS 60

PEAK DATA: 1 10 G @ 150 48 MS, -2.17 G @ 37 12 MS

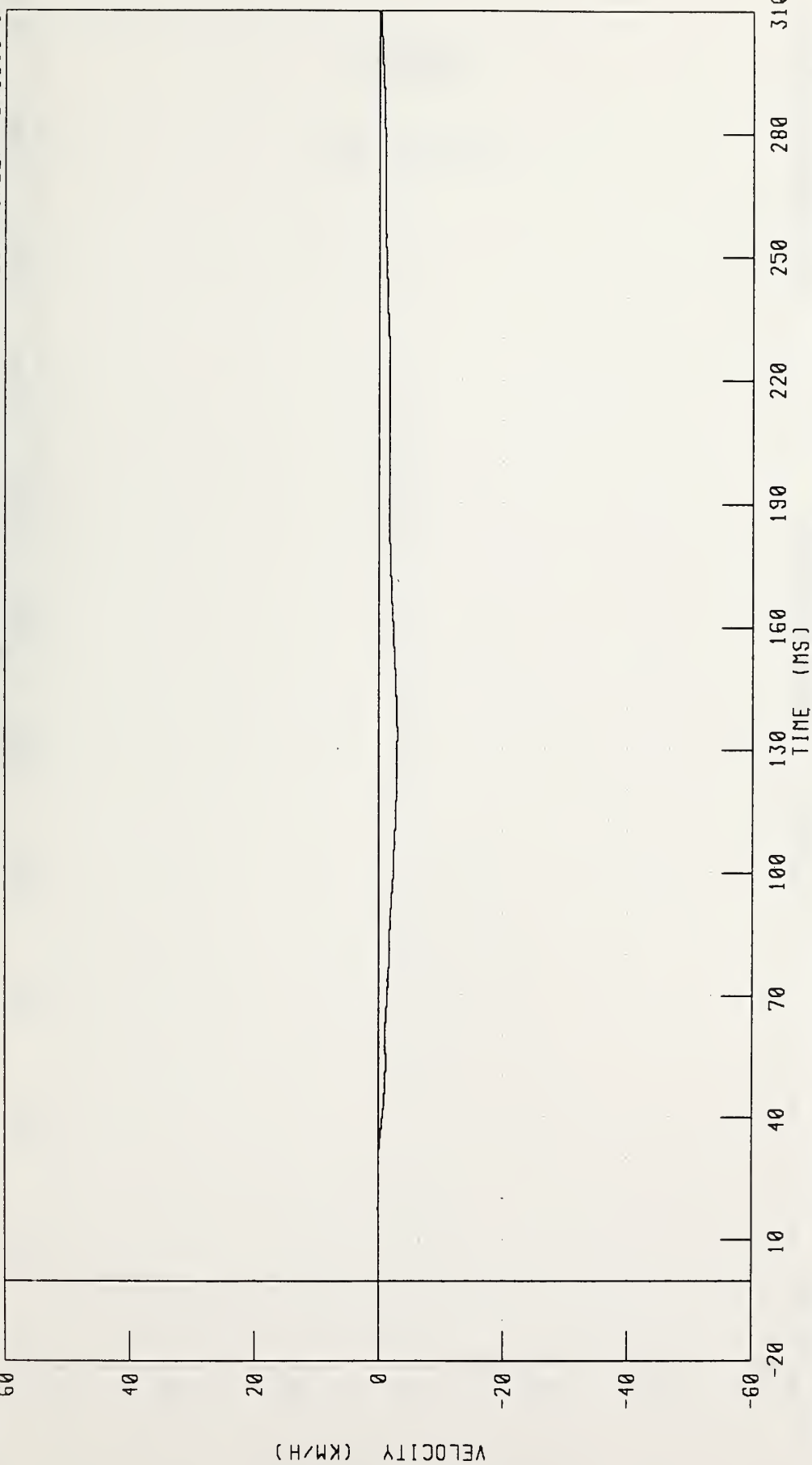
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1



CHANNEL RRSYV1

FILTER: CH CLASS 180

TIME (MS)

PEAK DATA 0 10 KM/H @ 17 76 MS, -2 95 KM/H @ 134 88 MS

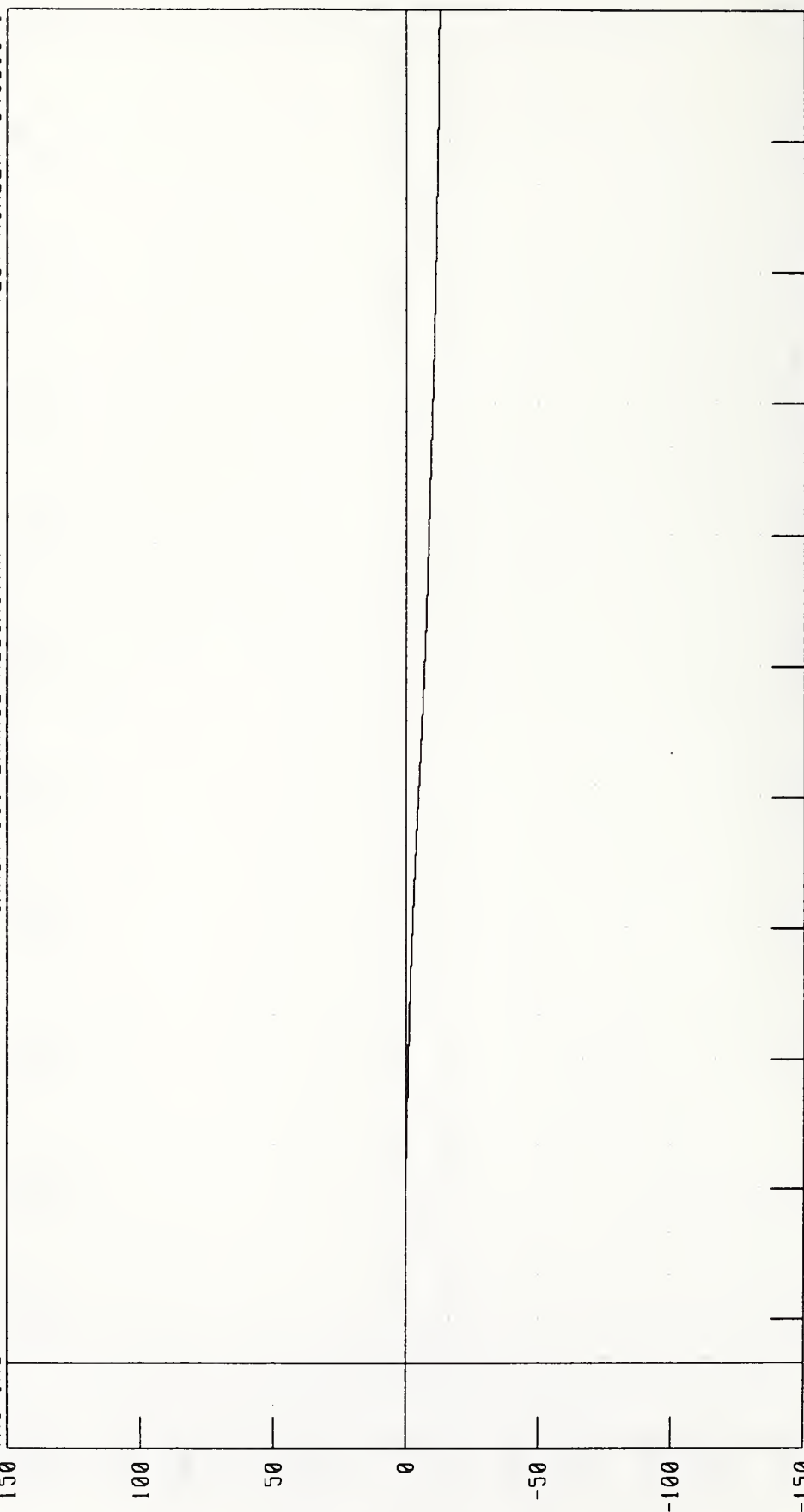
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-1

TRC INC



CHANNEL RRSYD1 FILTER CH CLASS 180

TIME (MS)

PEAK DATA: 0 40 MM @ 30 48 MS, -124 86 MM @ 310 00 MS

Data Plots

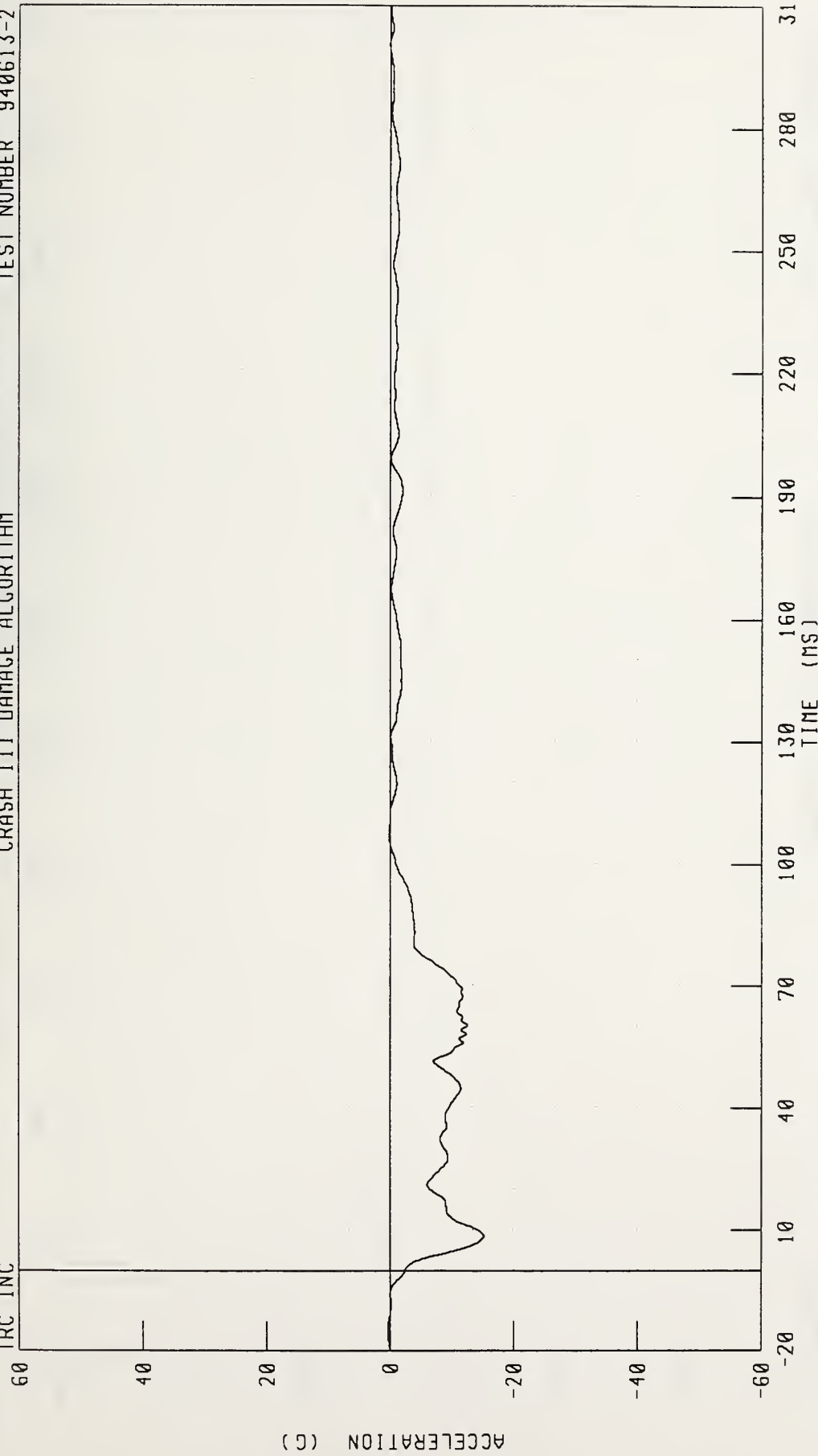
Test No. 940613-2



1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG X-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



CHANNEL VCGXG1 FILTER CH CLASS 60

PEAK DATA 0 39 G 0 -15 52 MS, -15 16 G 0 8 48 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC

60

40

20

0

-20

-40

-60

VELOCITY (KM/H)

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

TIME (MS)

CHANNEL VCGXV1 FILTER CH CLASS 180

PEAK DATA: 24.10 KM/H @ 0 00 MS, -10.91 KM/H @ 310 00 MS

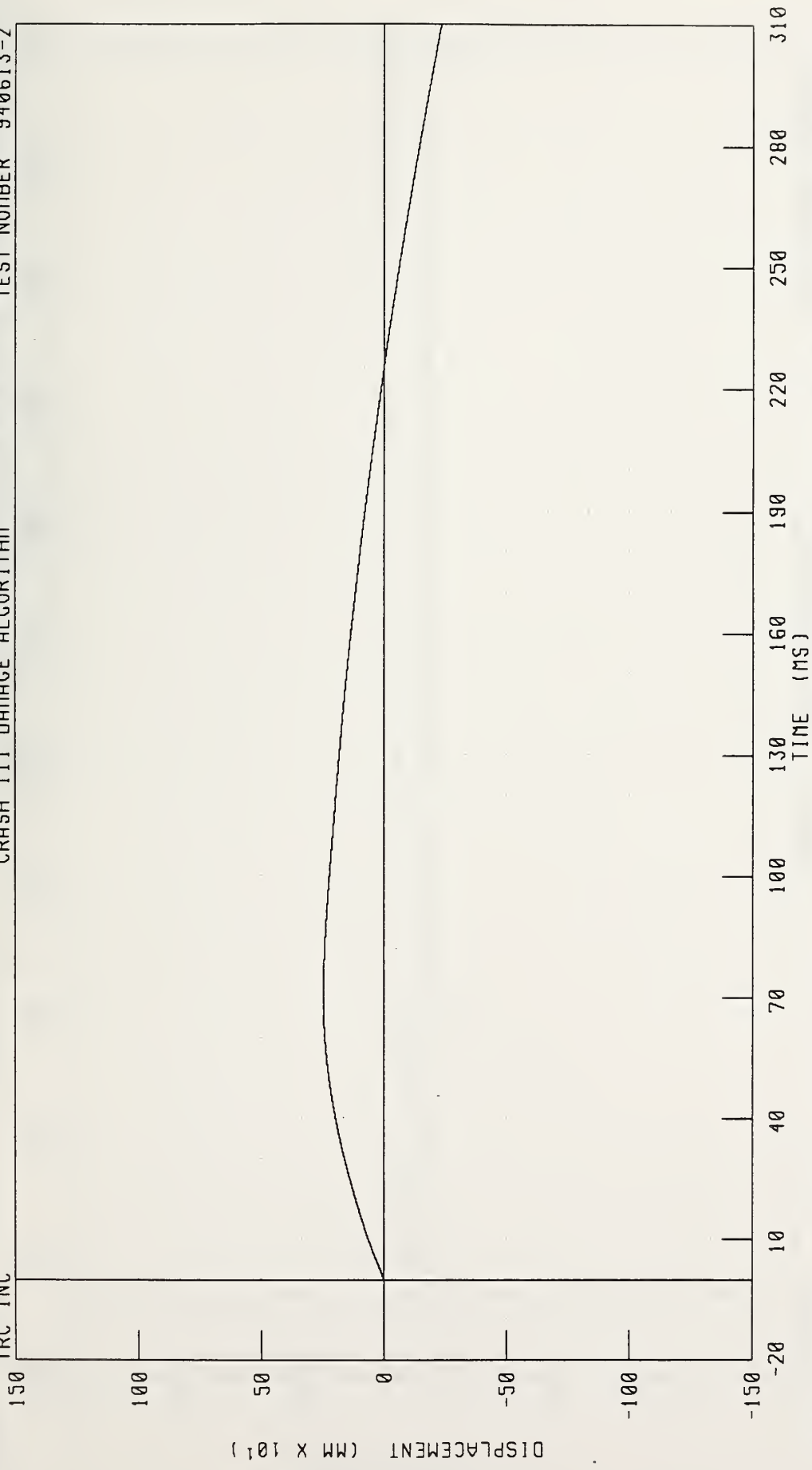
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS DISPLACEMENT

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

IRC INC



CHANNEL VCGX01 FILTER CH CLASS 180

TIME (MS)

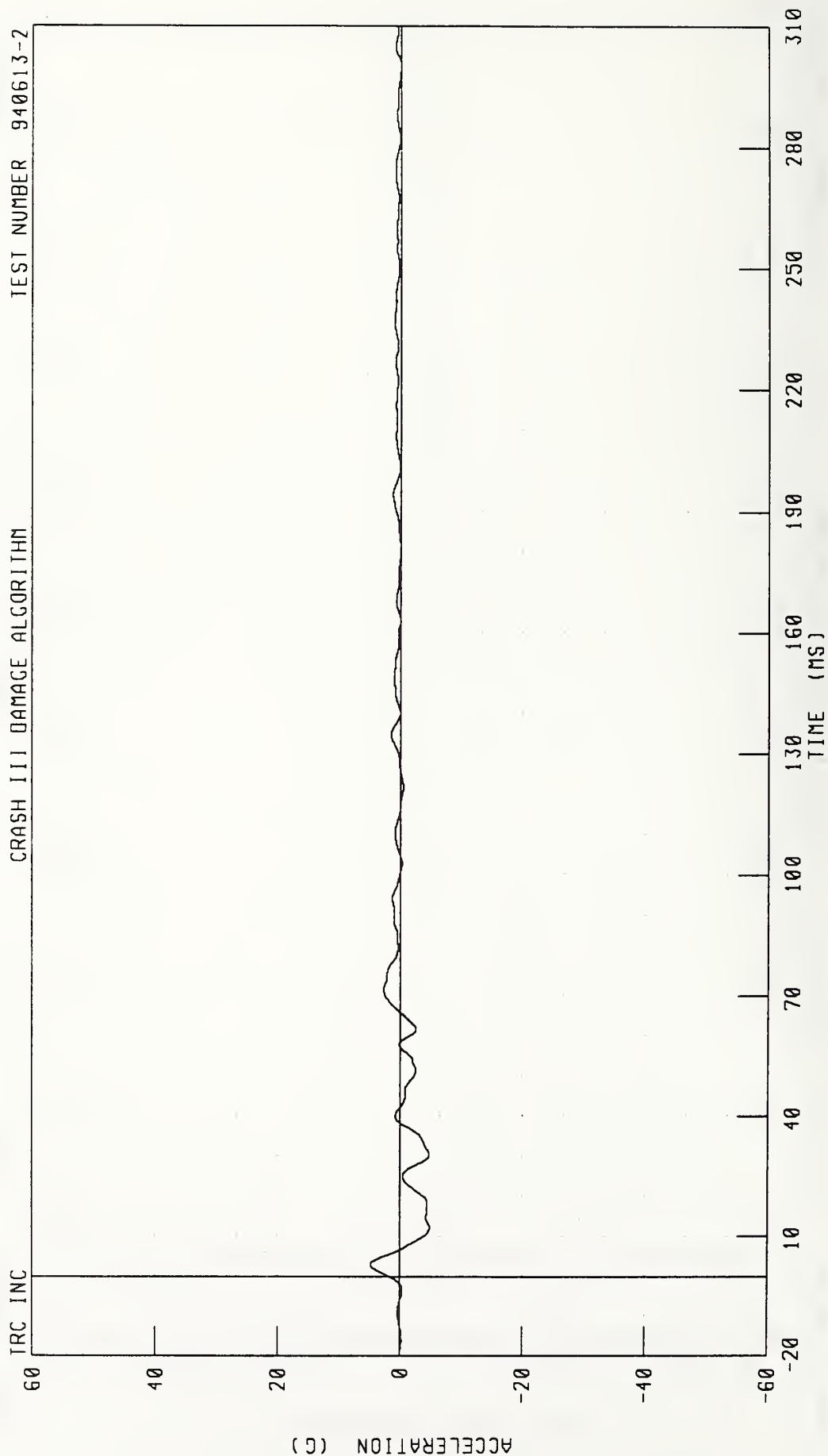
PEAK DATA 247 11 MM @ 70 40 MS, -233 39 MM @ 310 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



CHANNEL: VCGY01 FILTER: CH. CLASS 60

PEAK DATA: 4.78 G @ 2.88 MS, -4.83 G @ 12.16 MS

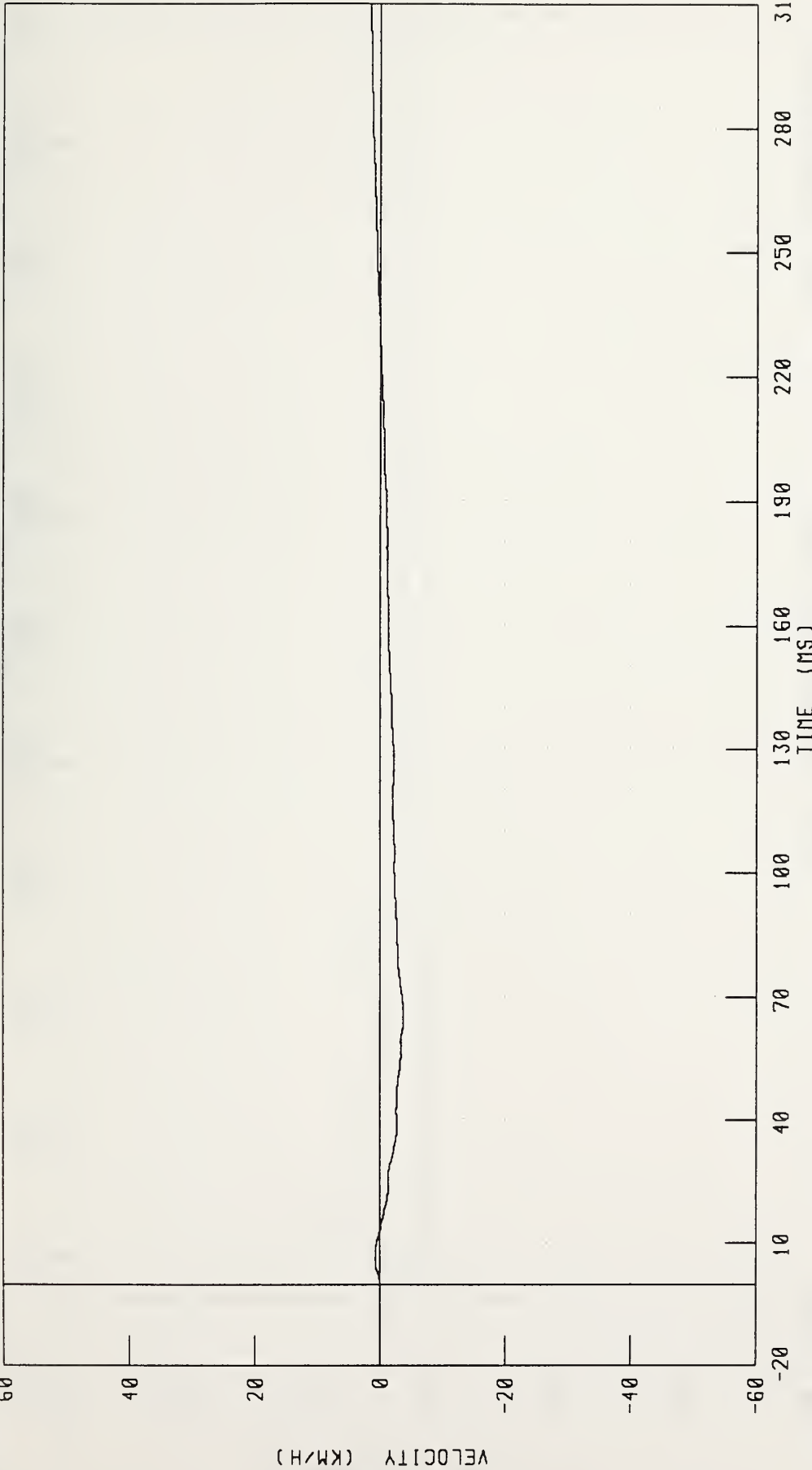
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS VELOCITY

IRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



CHANNEL VCGYV1

FILTER CH CLASS 180

TIME (MS)

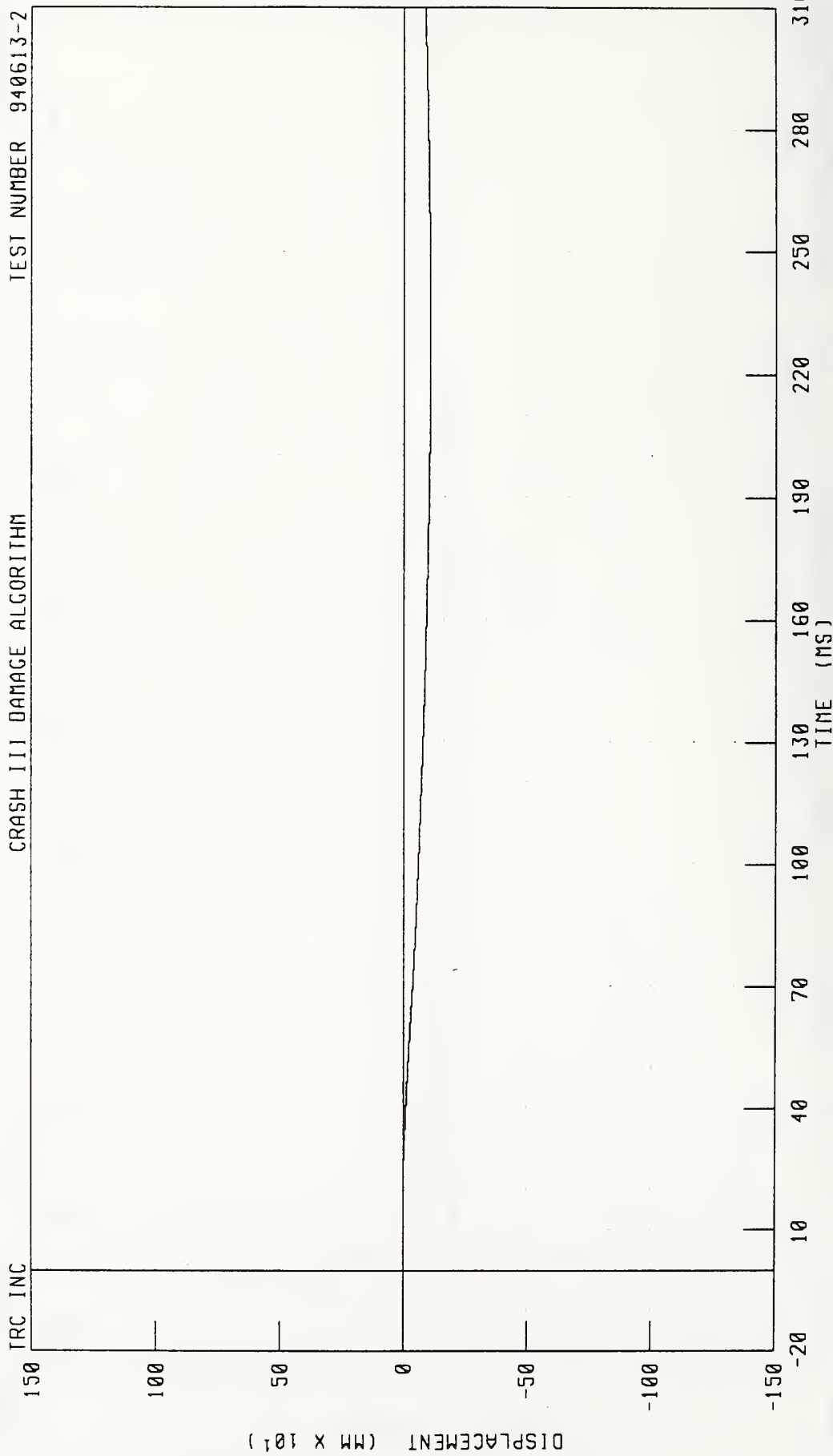
PEAK DATA: 1 61 KM/H @ 310 00 MS; -3 74 KM/H @ 65 68 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



CHANNEL VCCYD1 FILTER CH CLASS 180

PEAK DATA: 1 68 MM @ 12 96 MS, -106 51 MM @ 231 12 MS

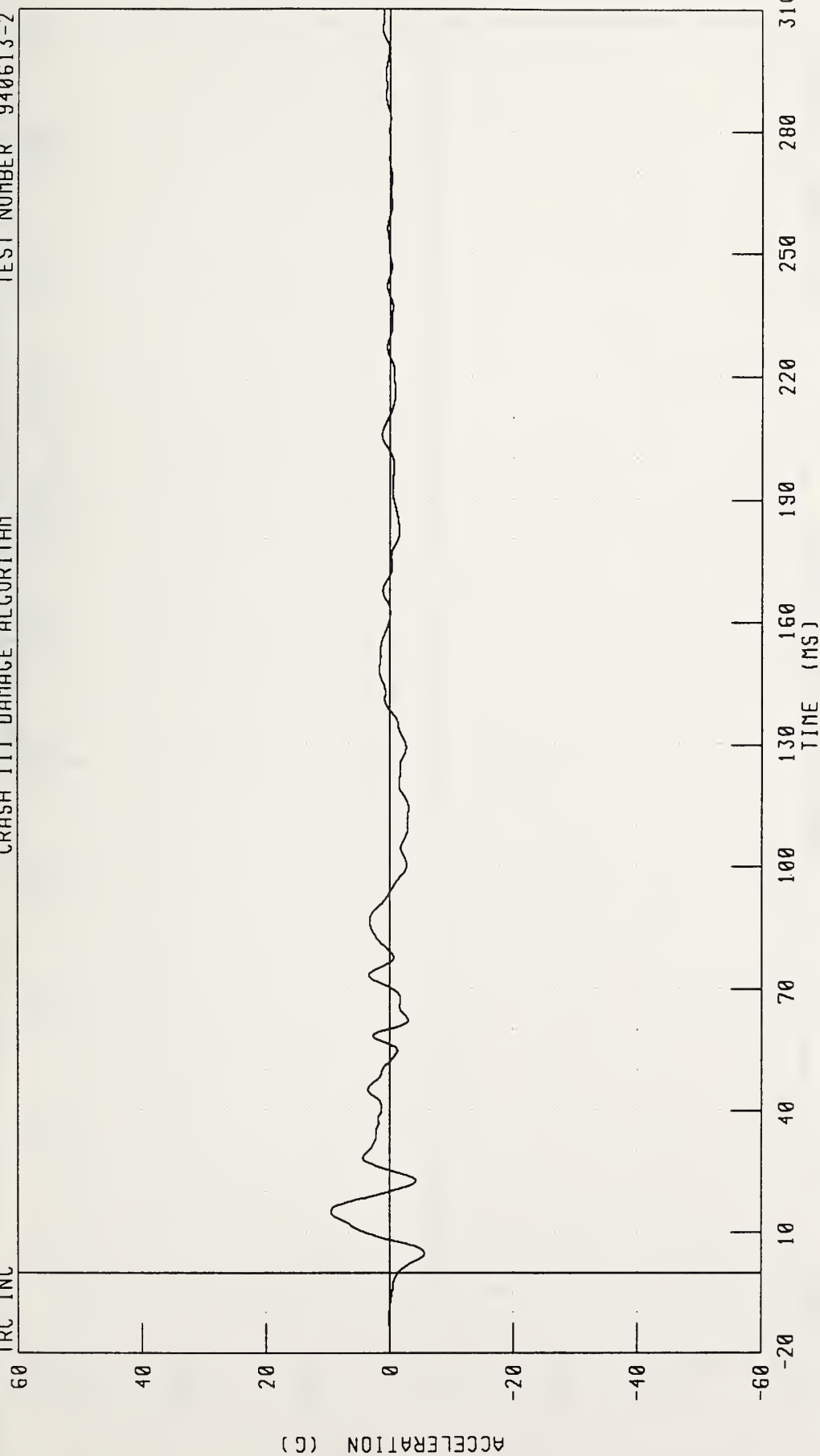
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS ACCELERATION

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

TRC INC



CHANNEL VCGZG1 FILTER CH CLASS 60

PEAK DATA: 9.51 G @ 15.20 MS; -5.61 G @ 4.72 MS

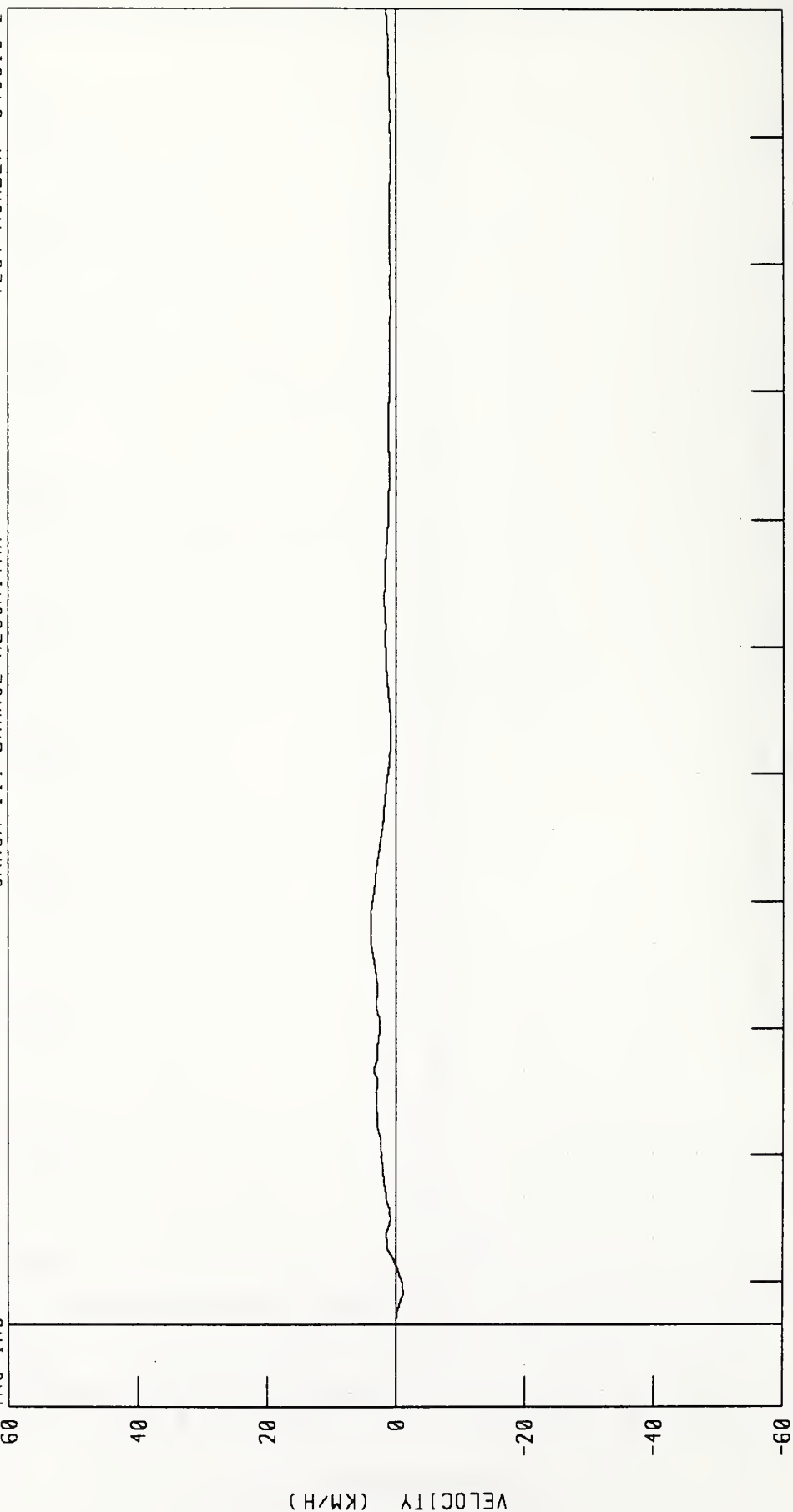
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



CHANNEL VCGZV1 FILTER CH CLASS 180

PEAK DATA 3.97 KM/H @ 93.76 MS, -1.14 KM/H @ 7.52 MS

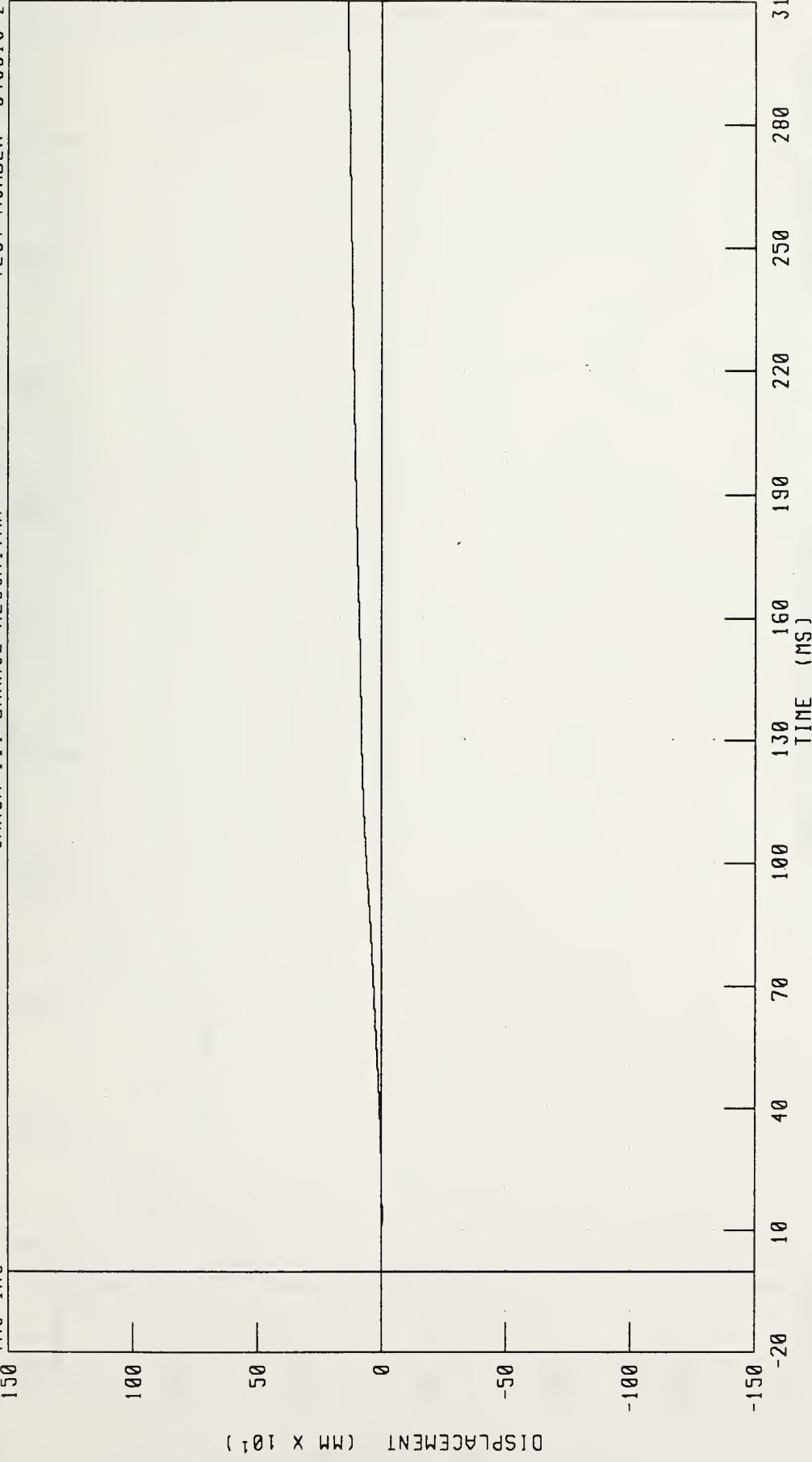
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



CHANNEL VCGZ01 FILTER CH CLASS 180

PEAK DATA 137 98 MM @ 310 00 MS, -2 14 MM @ 14 00 NS

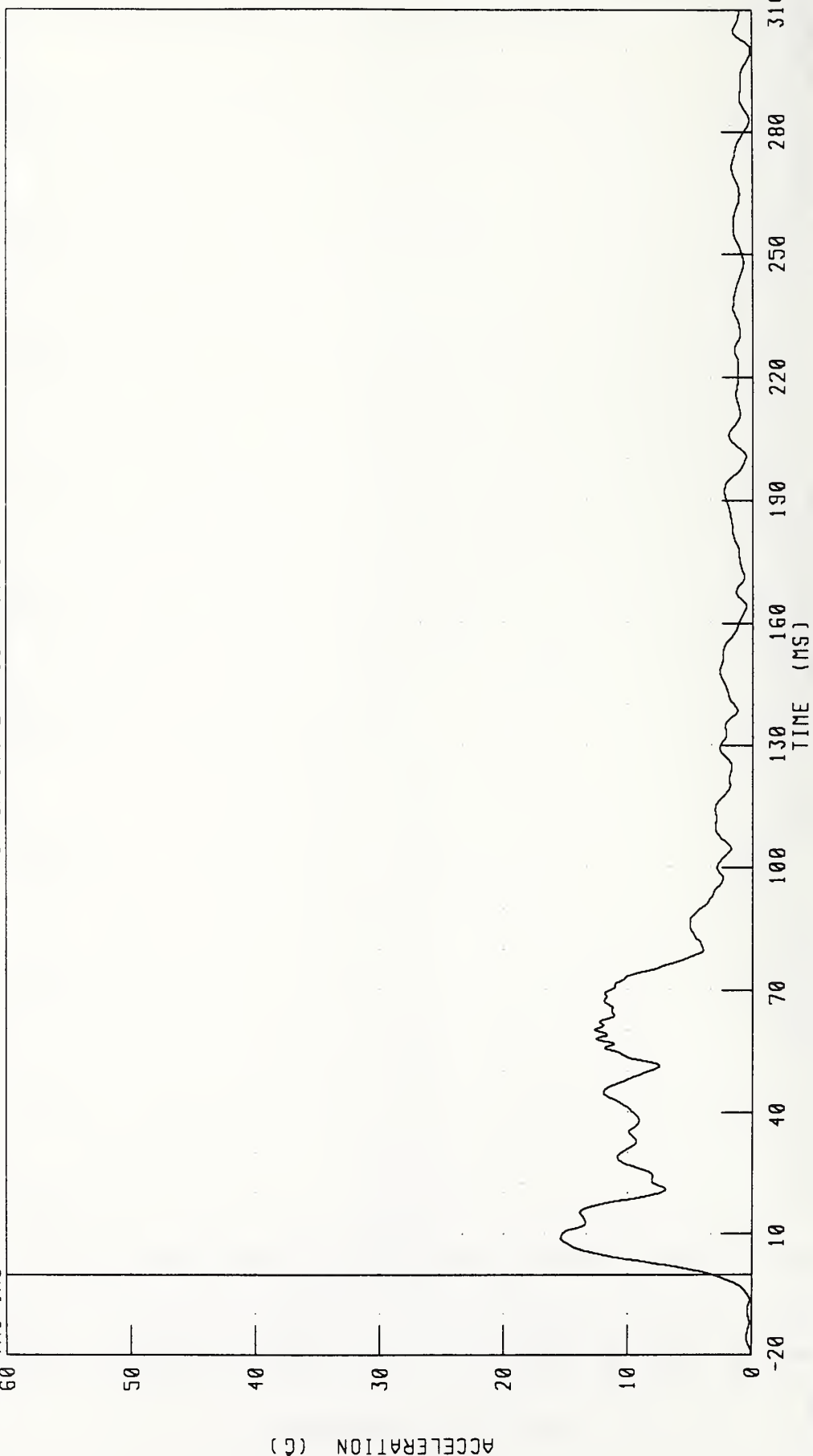
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG RESULTANT ACCELERATION

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

TRC INC



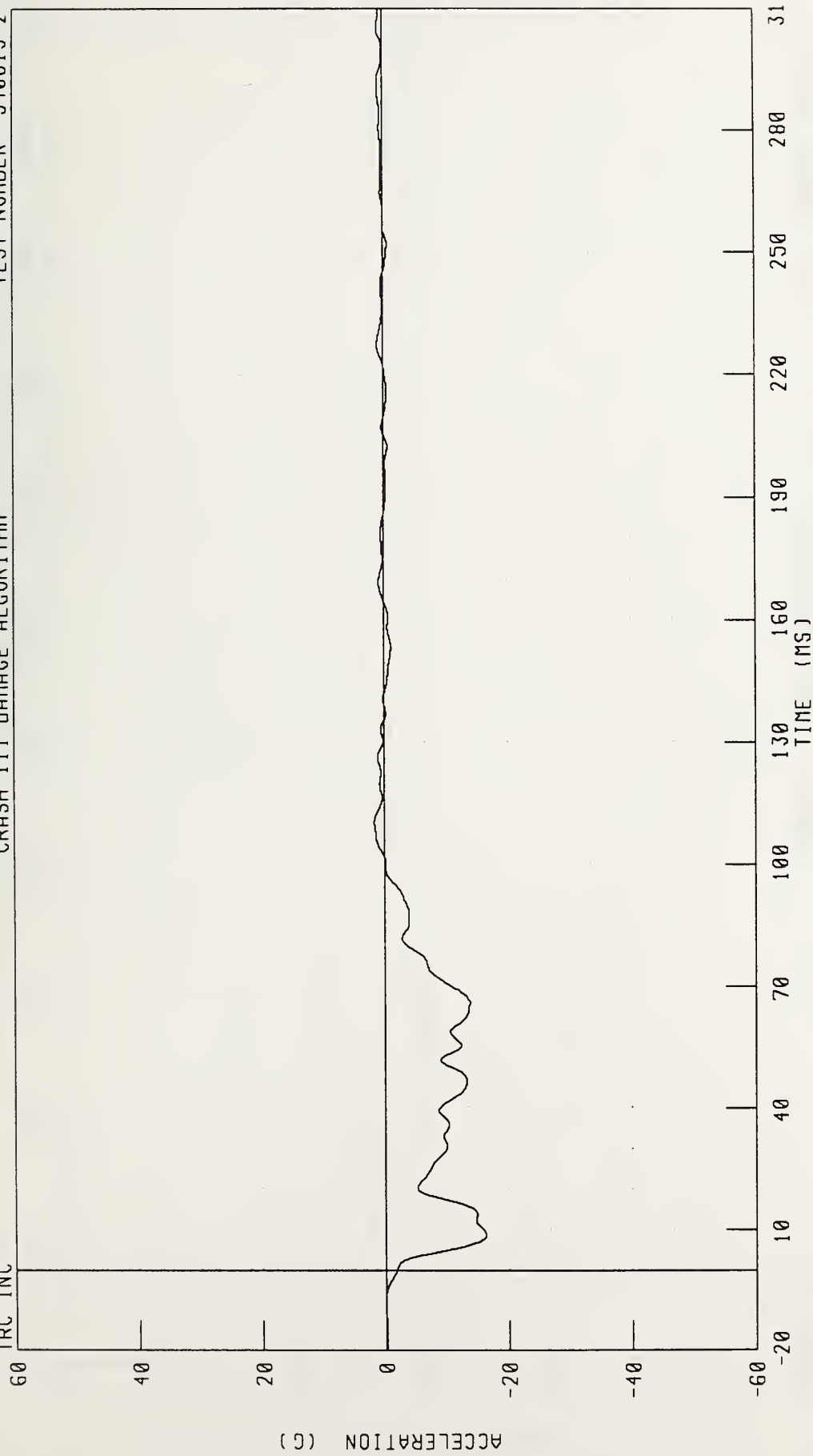
CHANNEL: VCGRG1 FILTER: CH CLASS 60

PEAK DATA: 15.41 G @ 896 MS; 0.06 G @ -20.00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



CHANNEL LRSXG1 FILTER CH CLASS 60

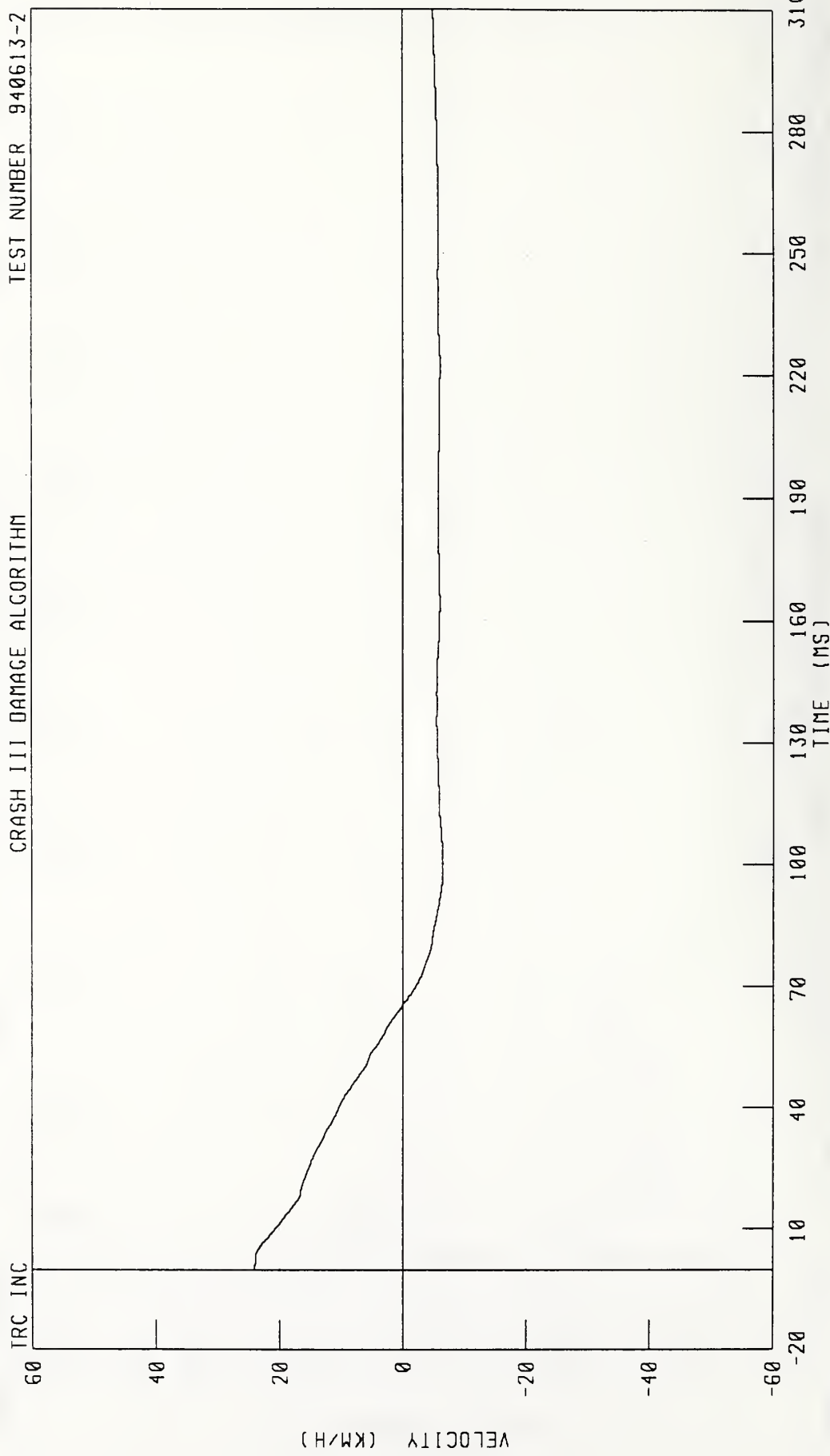
PEAK DATA 1 64 G @ 110 16 MS, -16 25 G @ 8 64 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



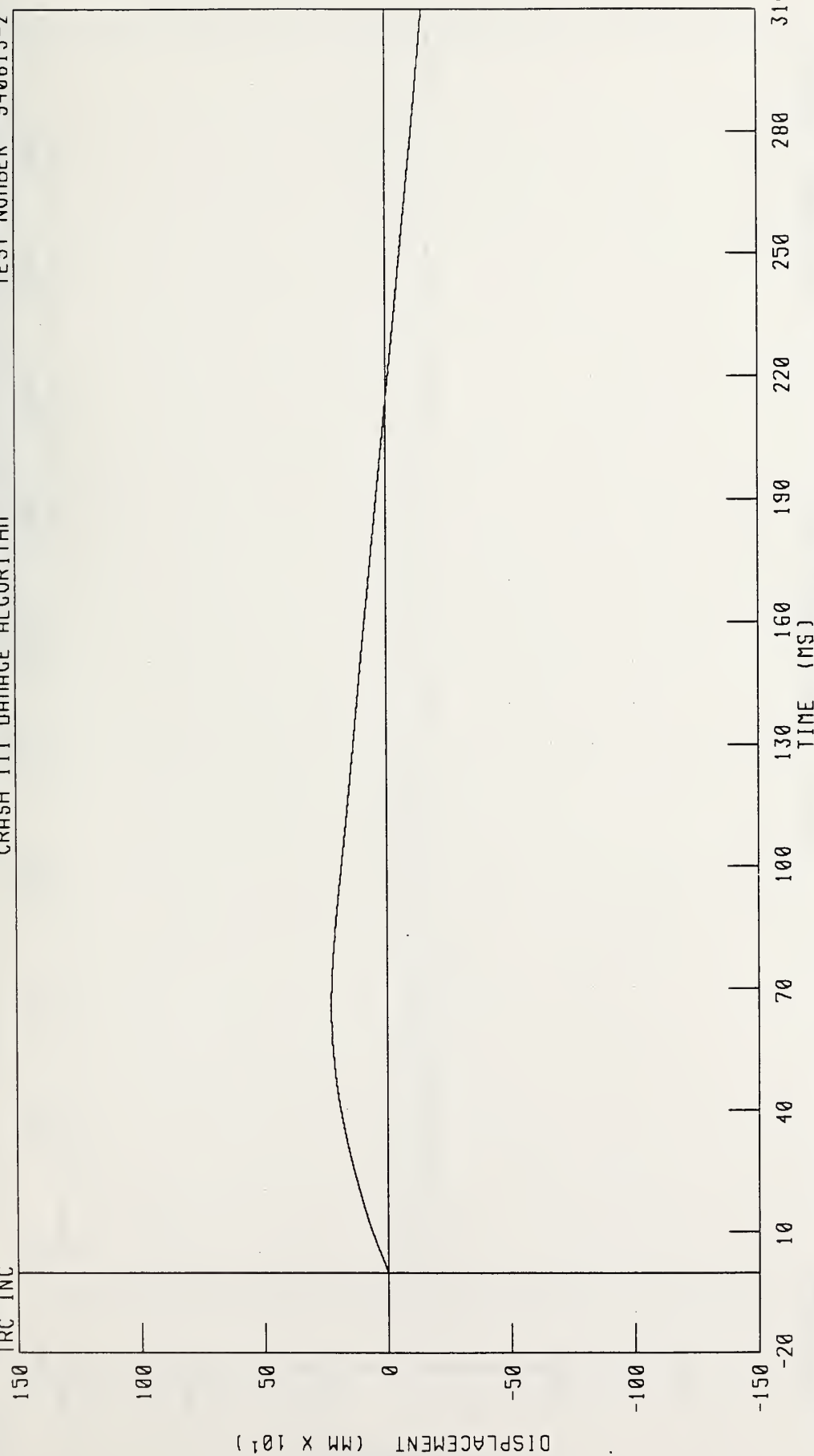
CHANNEL LRSXV1 FILTER CH CLASS 180

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS DISPLACEMENT

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

TRC INC



CHANNEL LRSXD1 FILTER CH CLASS 180

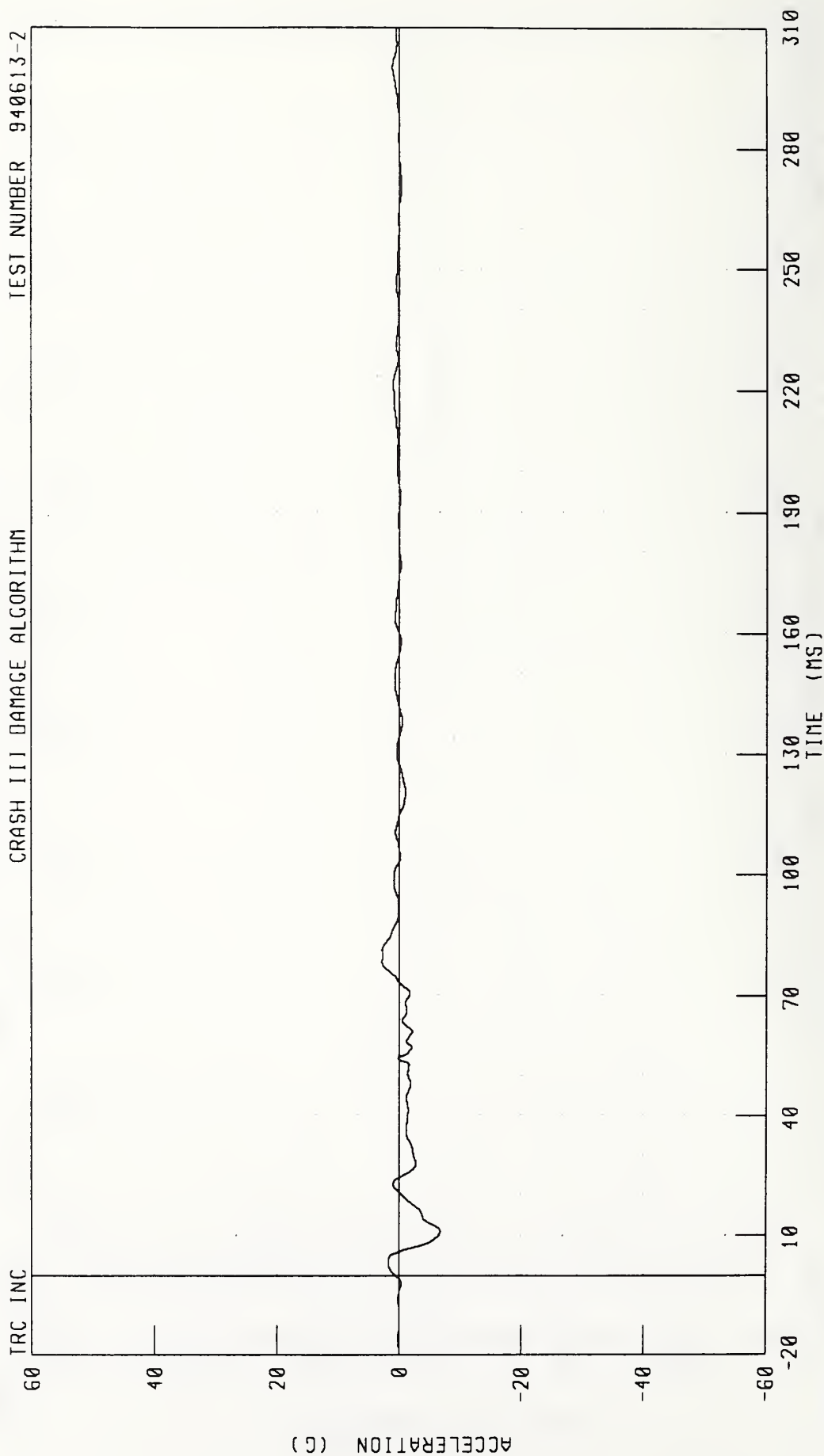
PEAK DATA 227 67 MM @ 65 44 MS, -149 35 MM @ 310 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



CHANNEL LRSYG1 FILTER CH CLASS 60

PEAK DATA 2 81 G @ 78 40 MS, -6 70 G @ 10 96 MS

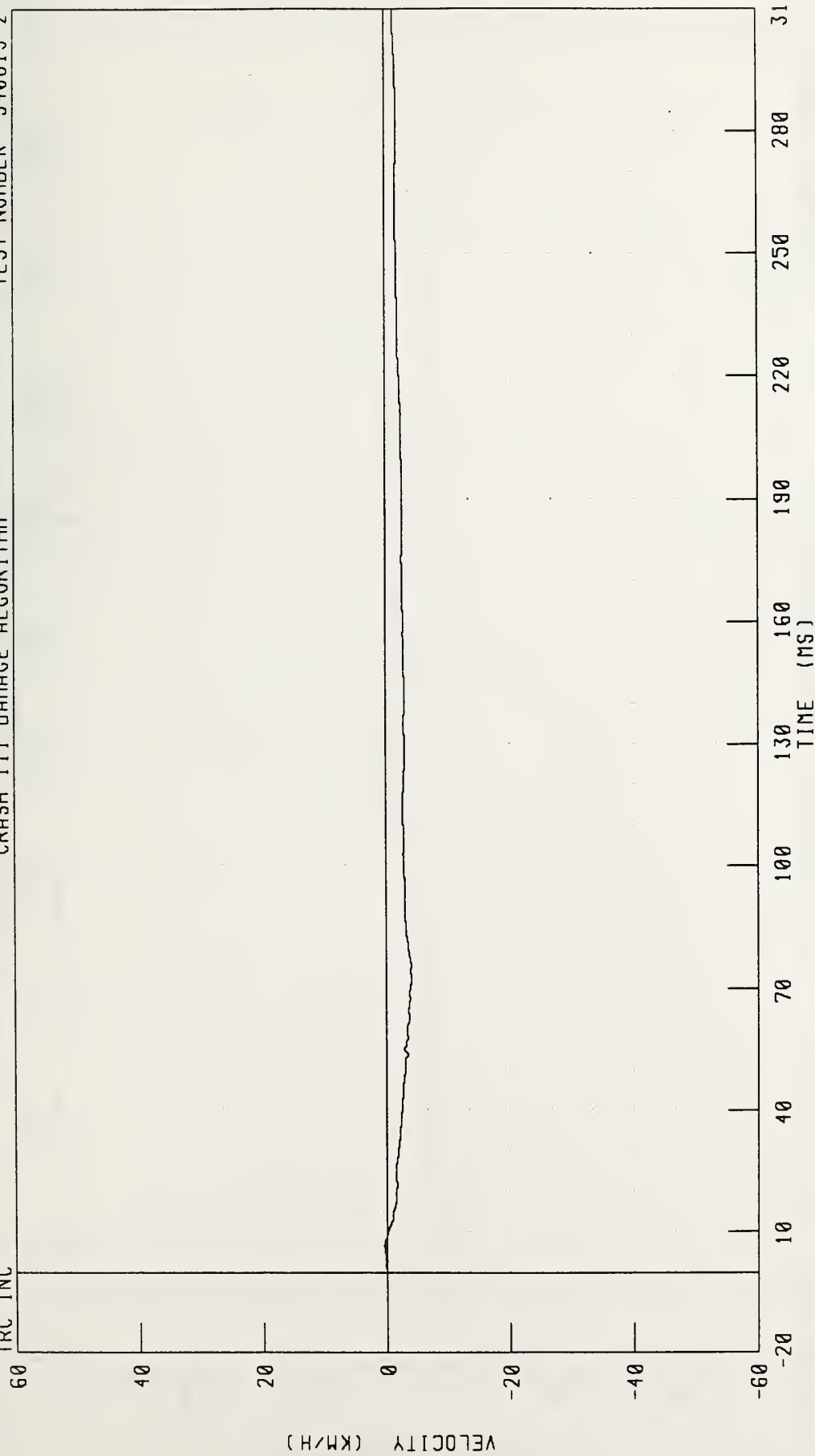
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS VELOCITY

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

TRC INC

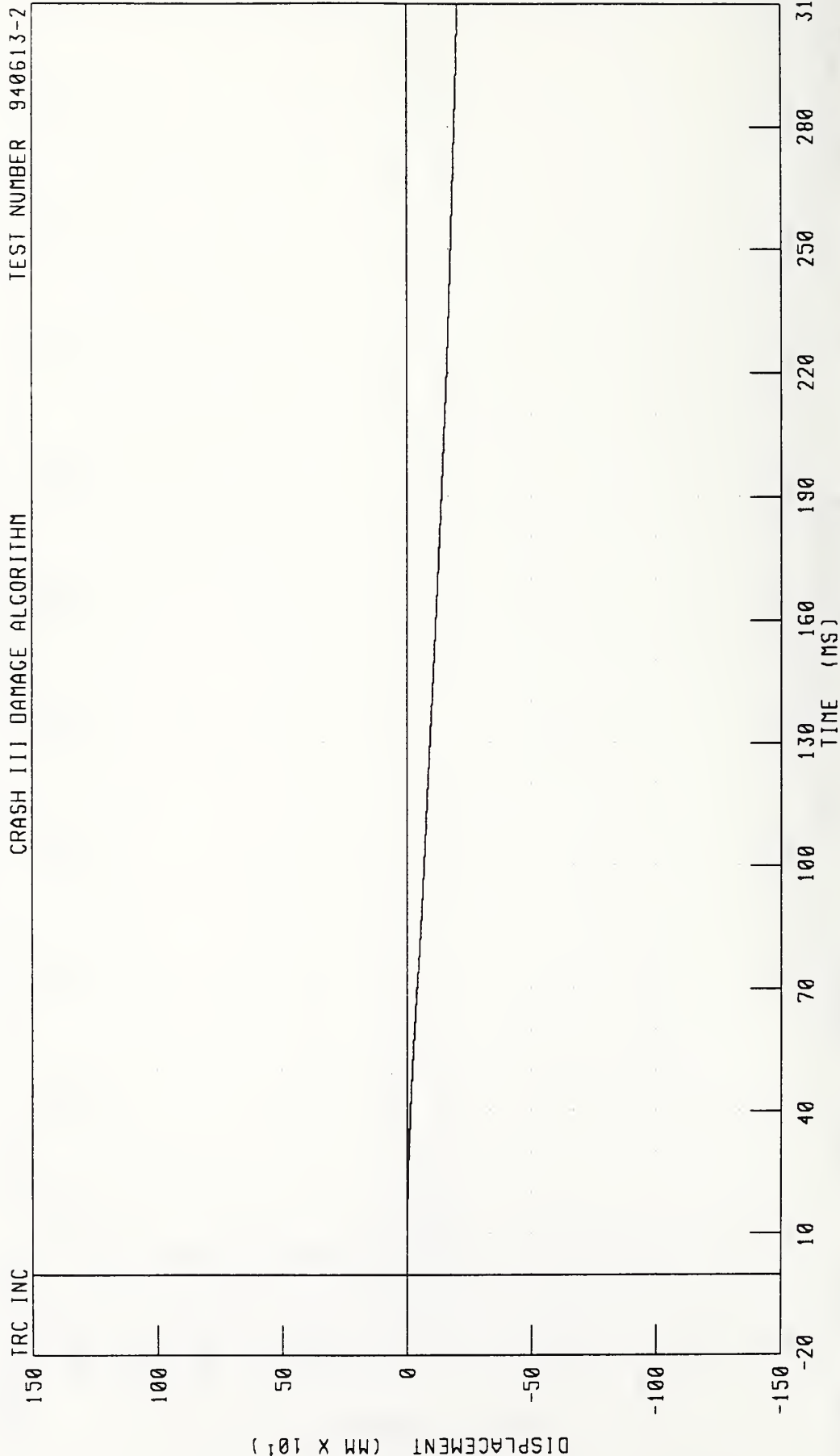


CHANNEL LRSYV1 FILTER: CH CLASS 180

PEAK DATA: 0.44 KM/H @ 6.56 MS, -4.04 KM/H @ 72.32 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-2



CHANNEL LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.57 MM @ 80 MS, -203.85 MM @ 310 00 MS

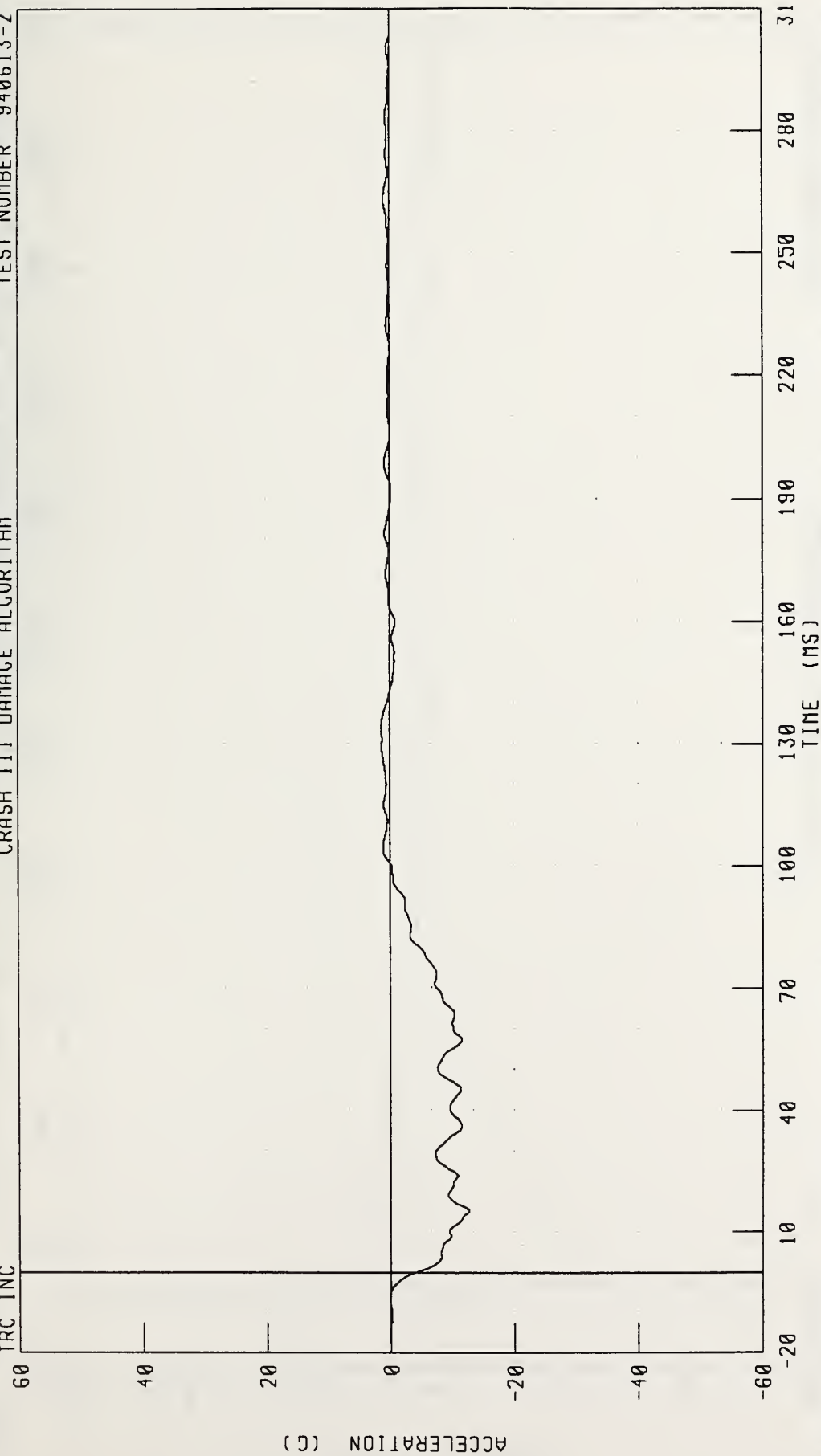
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



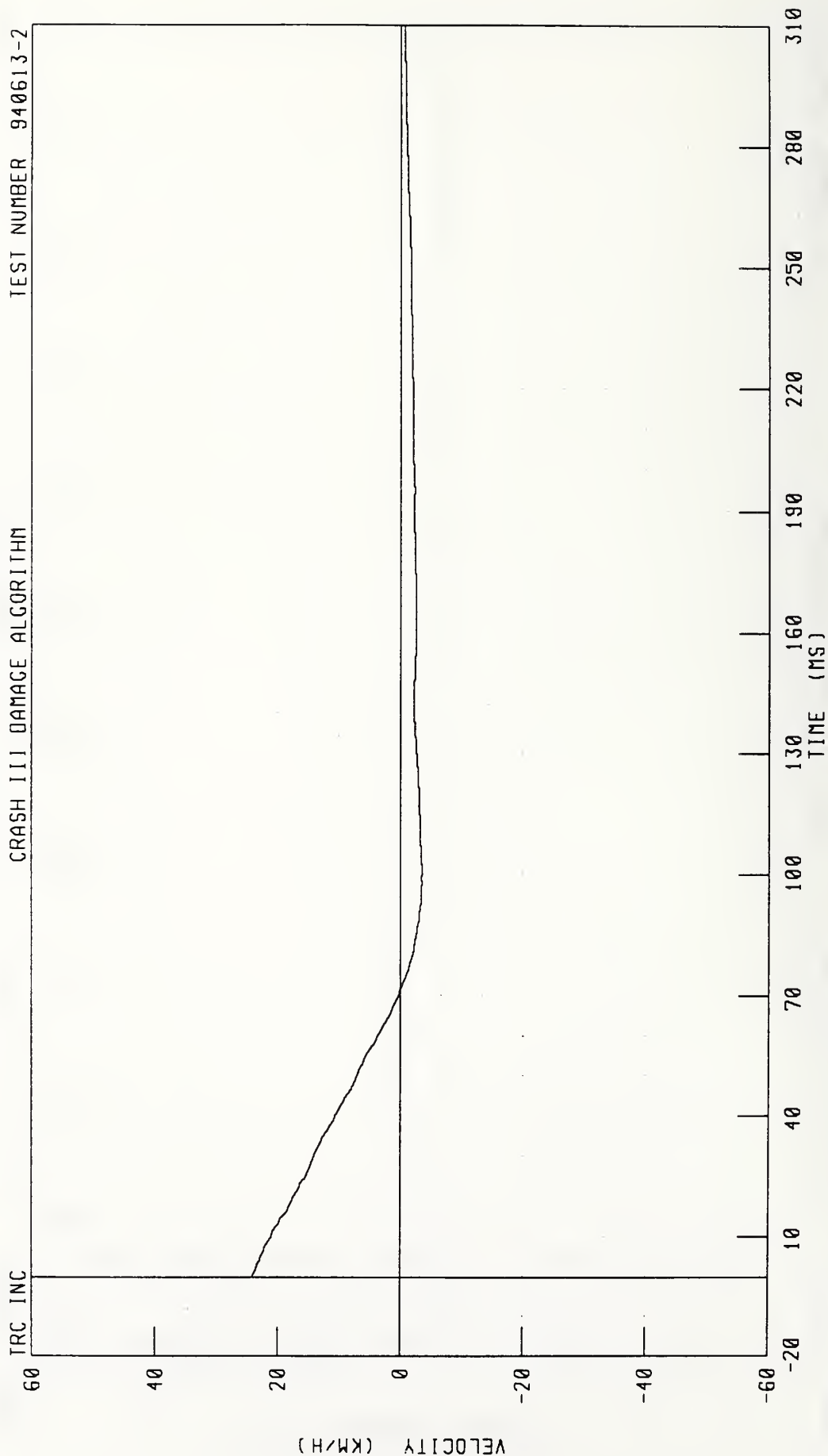
CHANNEL RRSXG1 FILTER CH CLASS 60

PEAK DATA 1.41 G @ 133.28 MS, -12.68 G @ 15.20 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-2



CHANNEL RRSXV1 FILTER CH CLASS 180

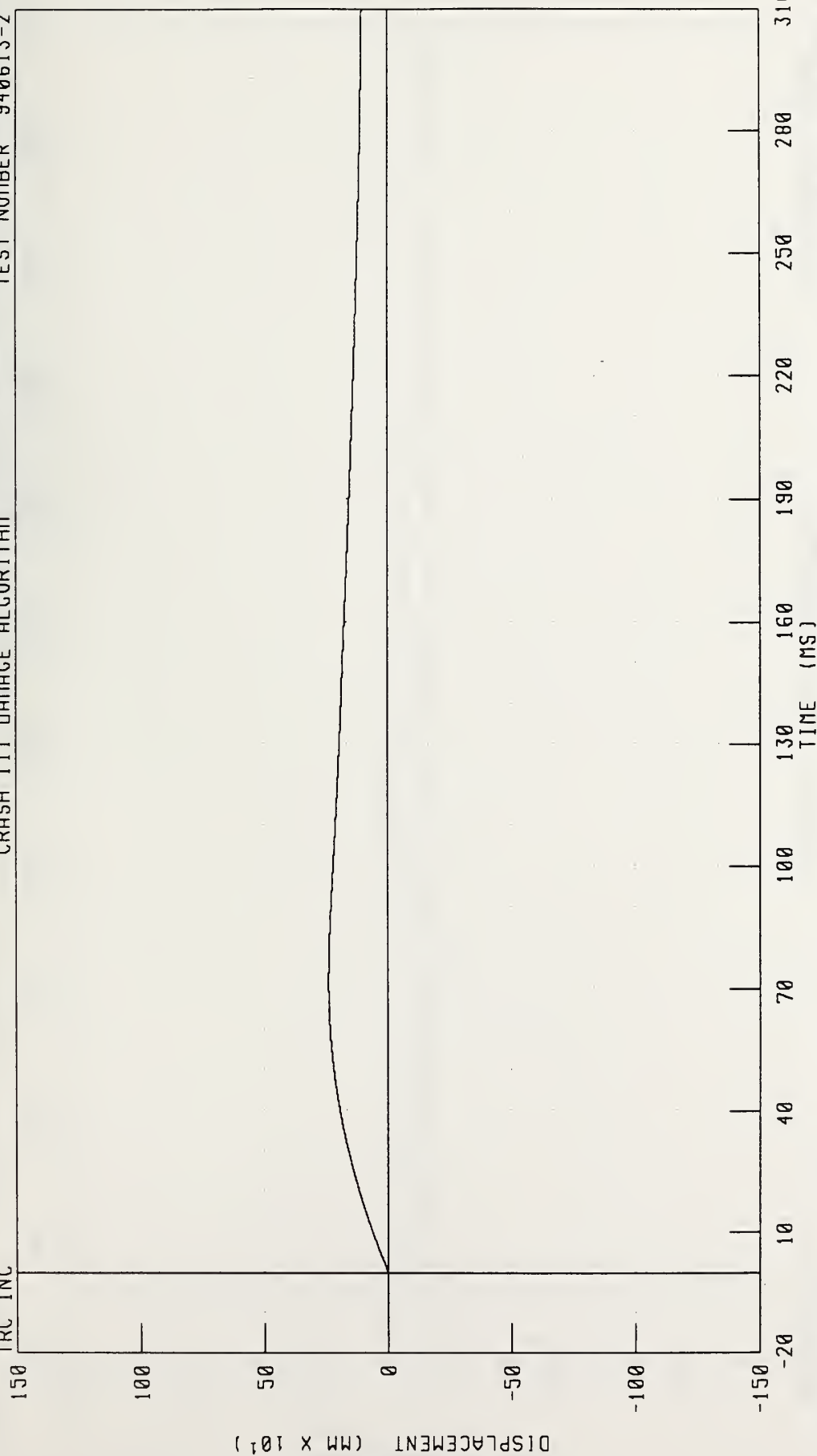
PEAK DATA: 24.10 KM/H @ 0.00 MS, -3.53 KM/H @ 100.88 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



CHANNEL: RRSX01 FILTER: CH. CLASS 180

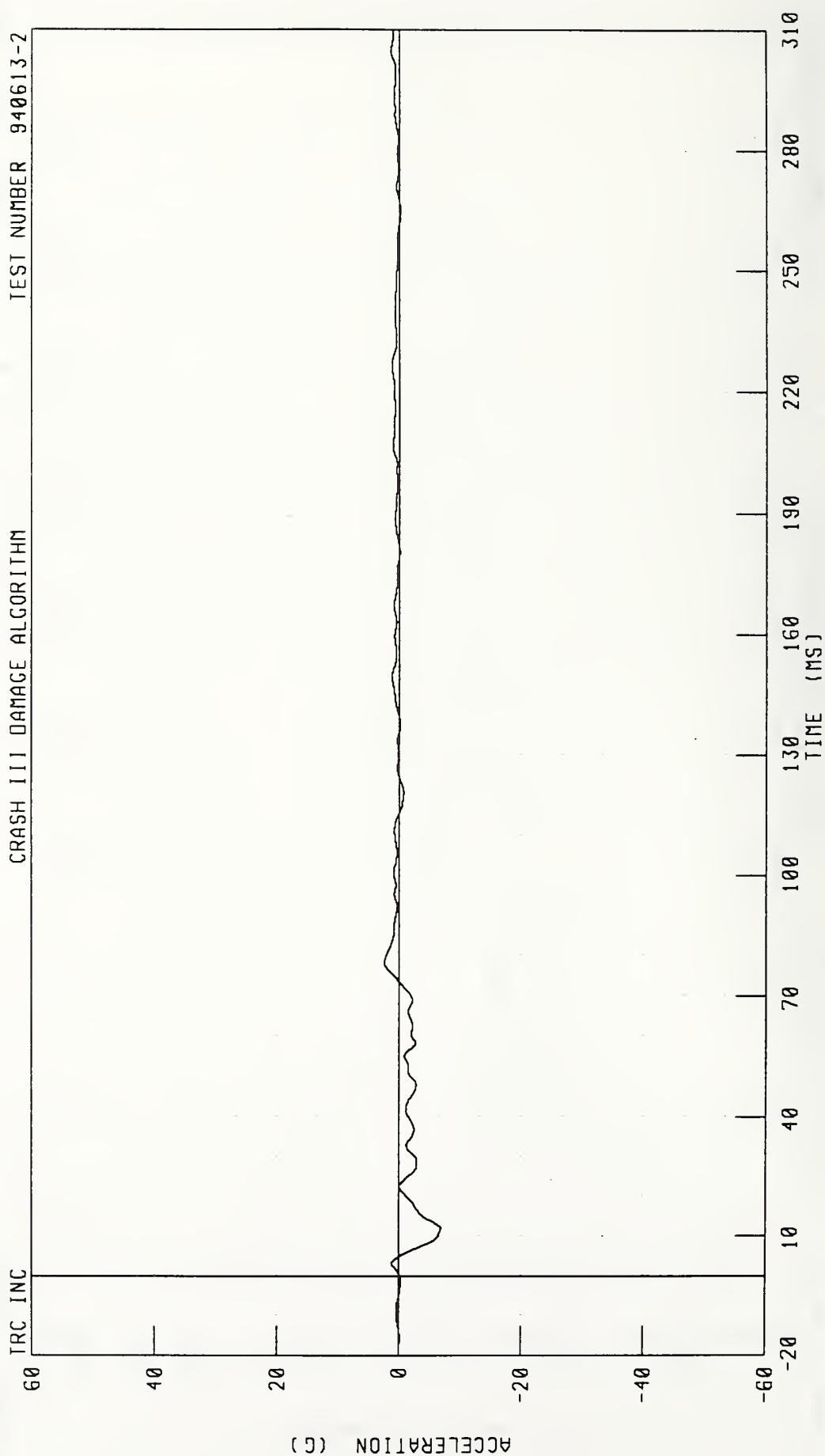
PEAK DATA: 239.66 MM @ 71.76 MS, 0.00 MM @ 0.00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2



CHANNEL RRSYG1 FILTER CH CLASS 60

PEAK DATA 2 46 G @ 78 16 MS, -6 87 G @ 11 92 MS

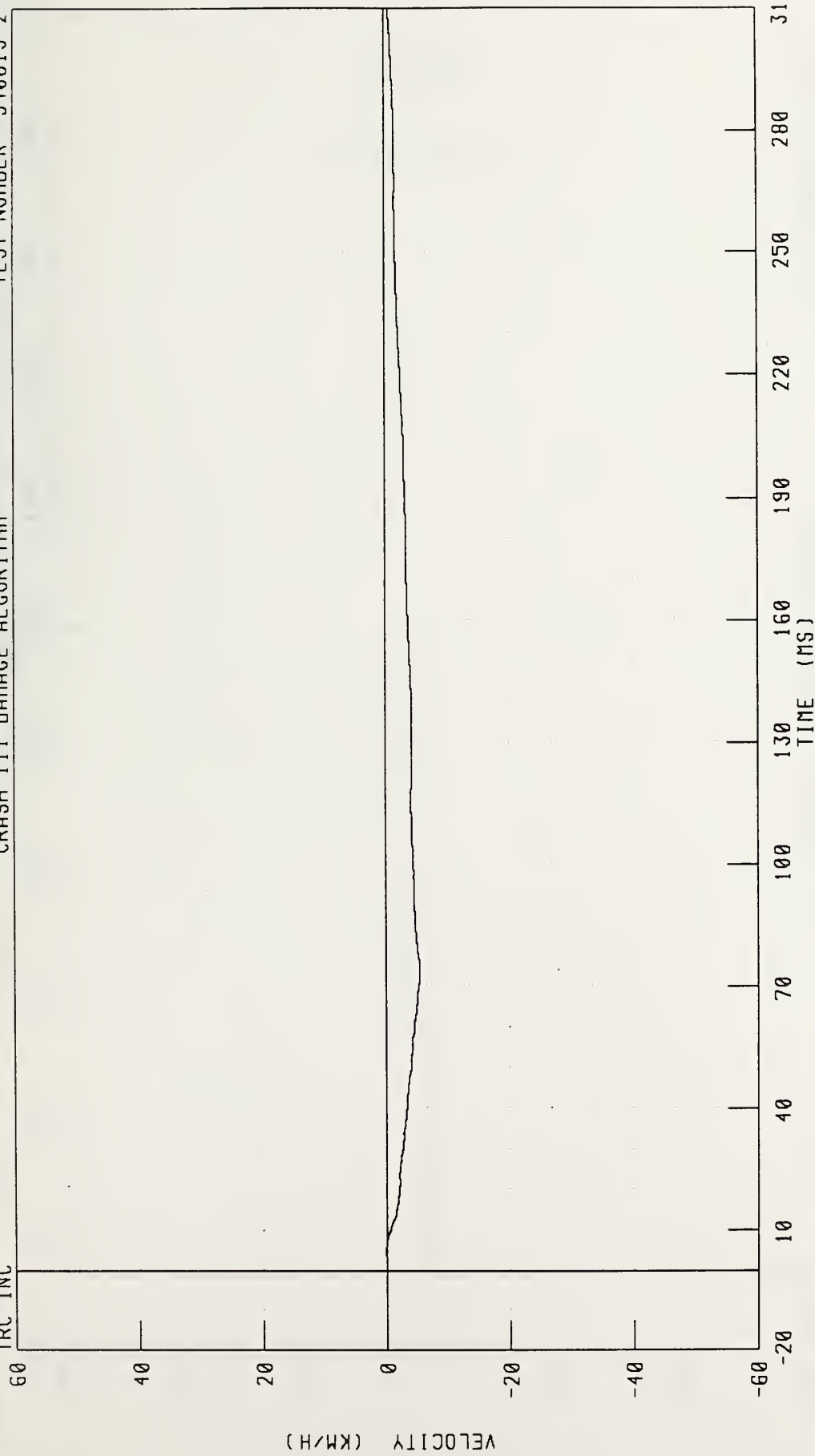
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS VELOCITY

TEST NUMBER 940613-2

CRASH III DAMAGE ALGORITHM

TRC INC



CHANNEL RRSYV1 FILTER CH CLASS 180

PEAK DATA 0 13 KM/H @ 4 24 MS, -5.40 KM/H @ 73 36 MS

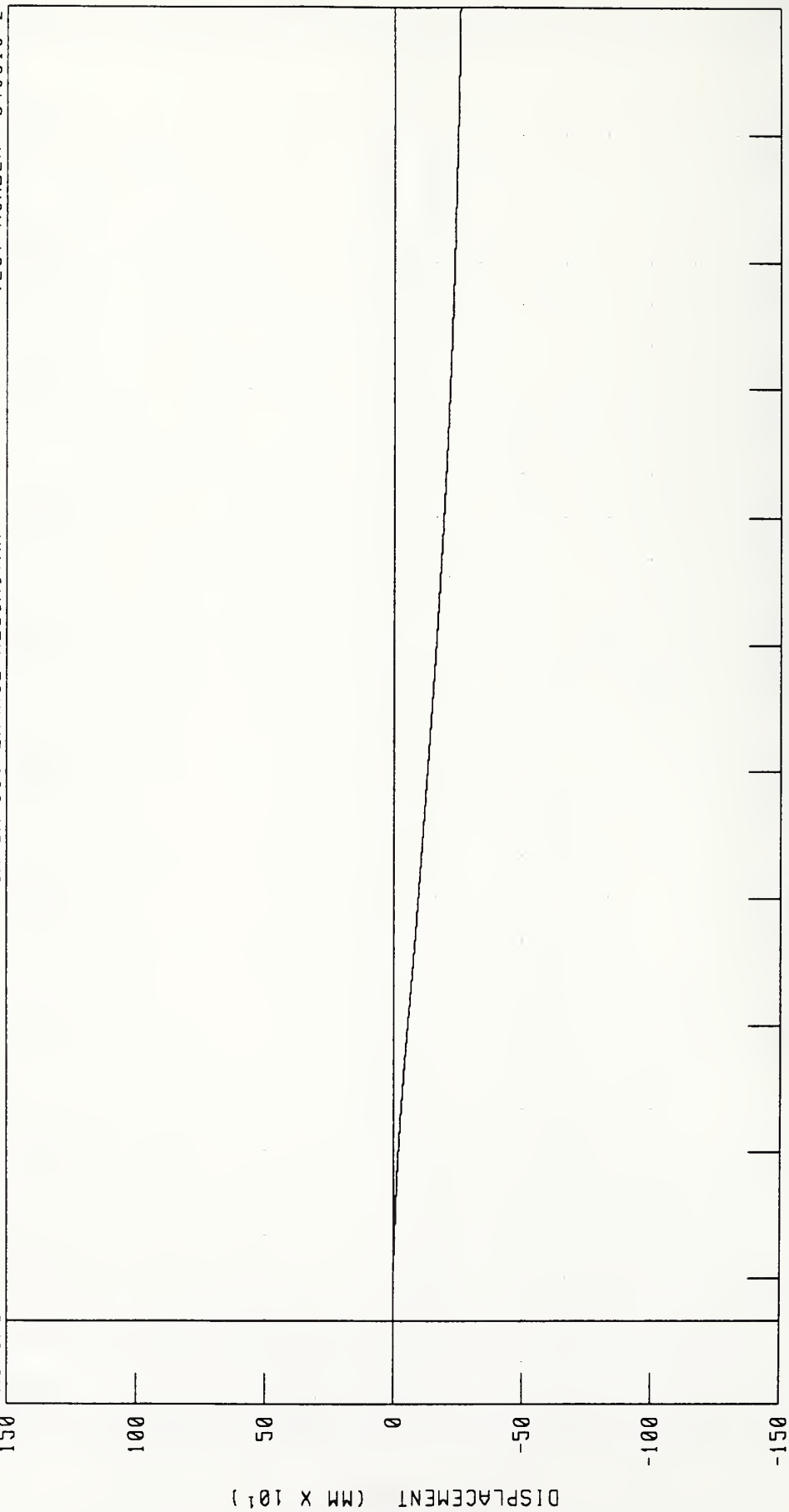
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-2

TRC INC



TIME (MS)

PEAK DATA: 0 08 MM @ 6 88 MS, -255 98 MM @ 310 00 MS

CHANNEL: RRSYD1 FILTER: CH CLASS 180

Data Plots

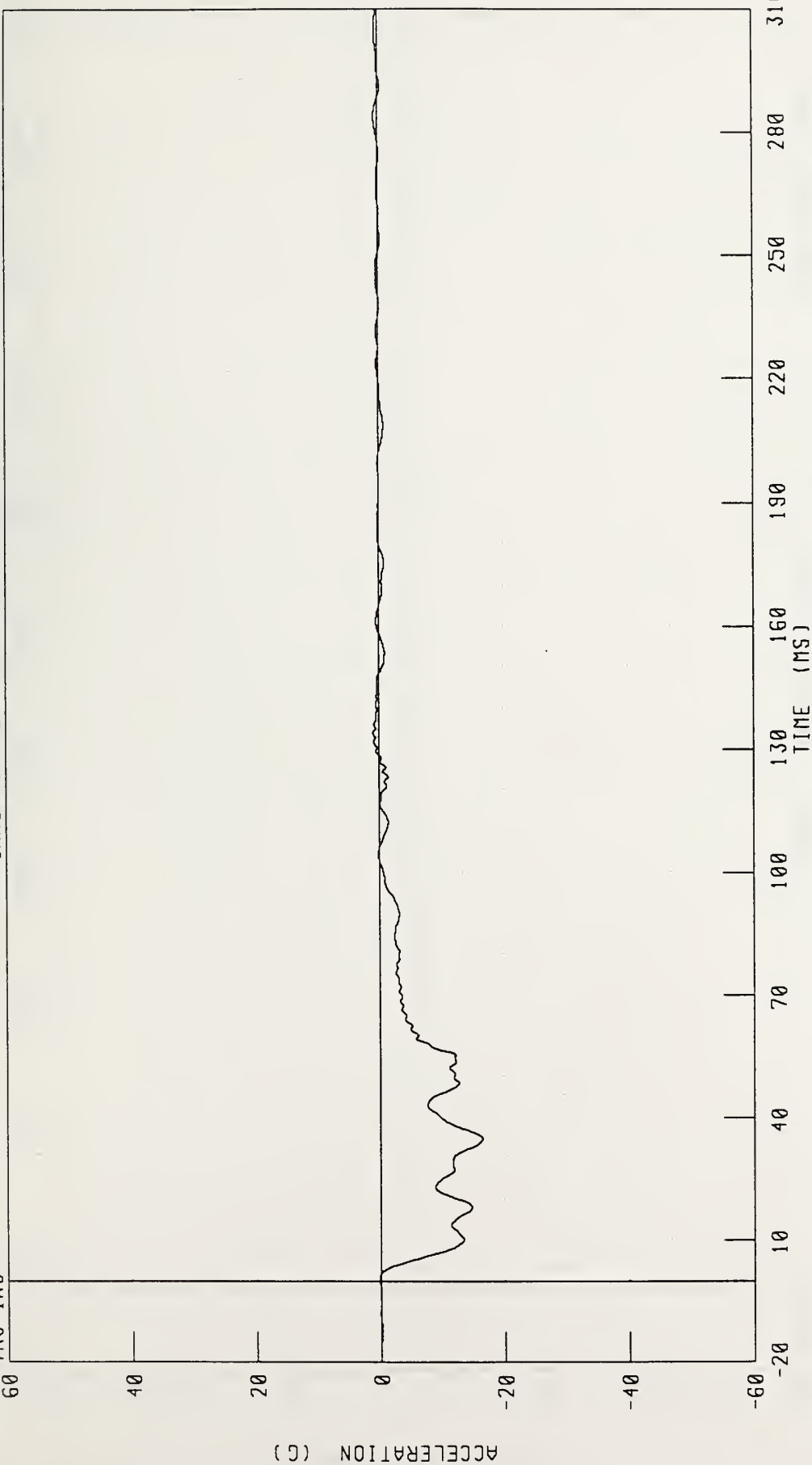
Test No. 940613-3



1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG X-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



CHANNEL VCGXG1 FILTER CH CLASS 60

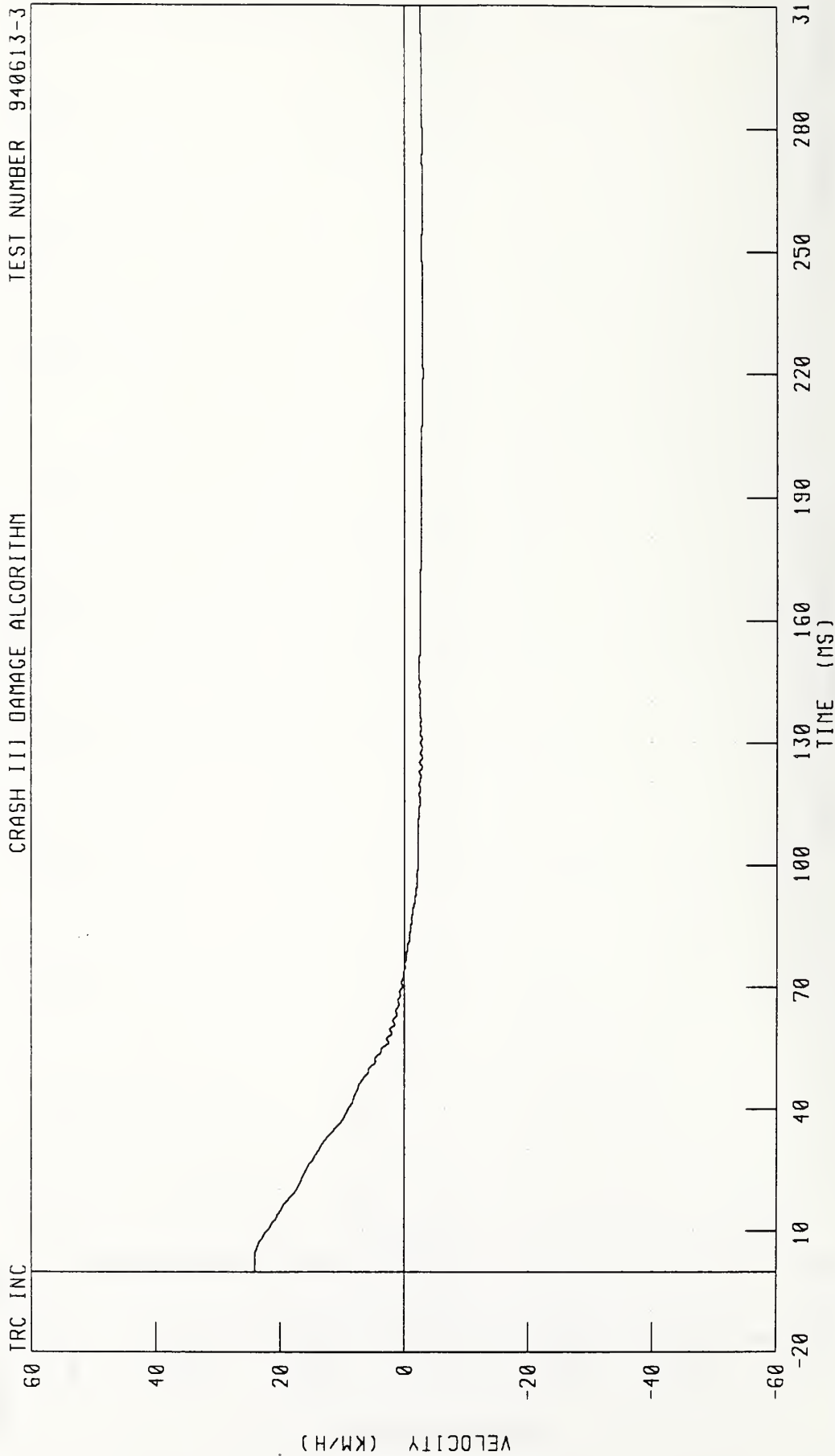
PEAK DATA 0 98 G @ 133 84 MS, -16 40 G @ 34 72 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3



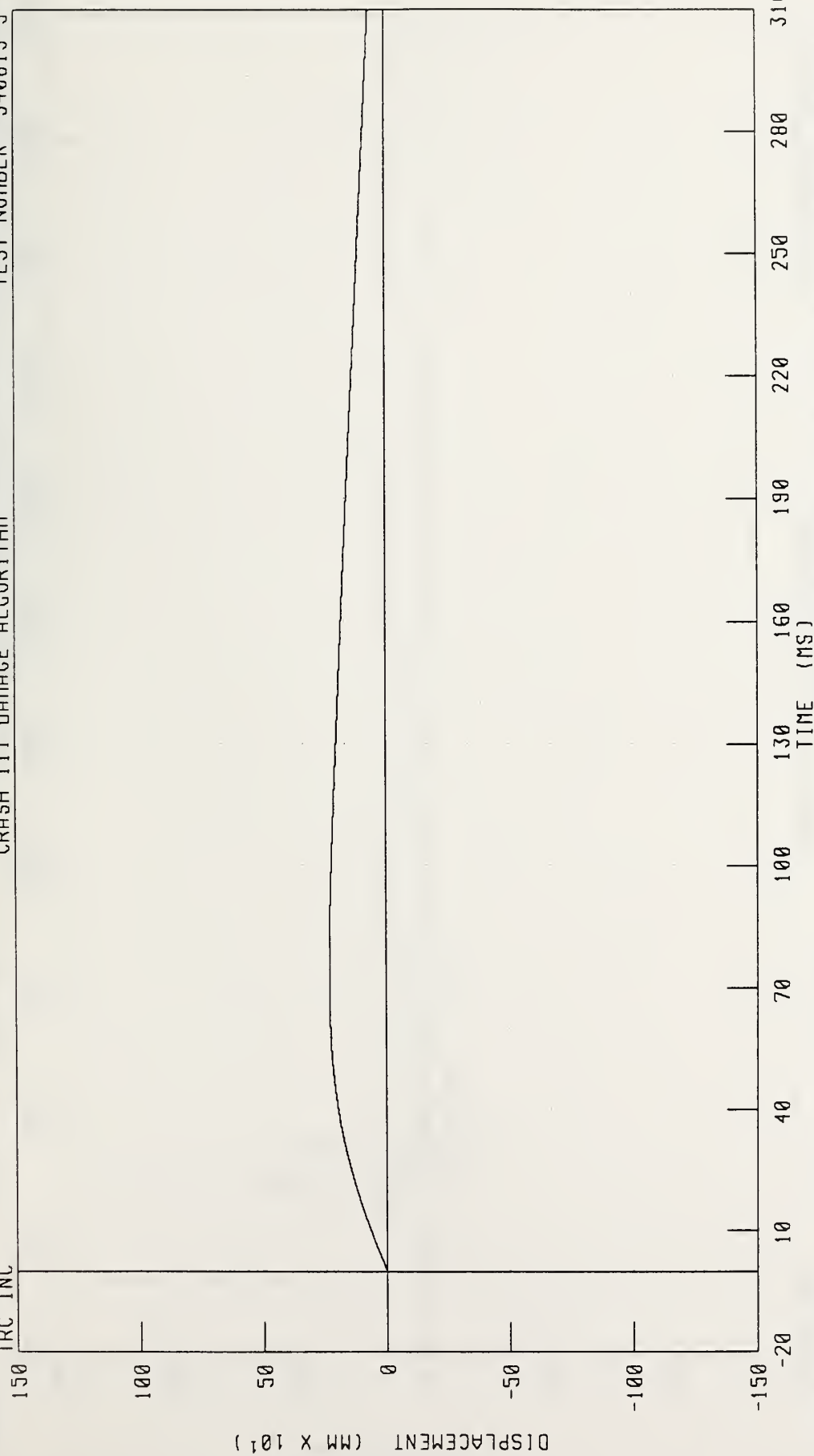
CHANNEL VCGXV1 FILTER CH. CLASS 180

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CC X-AXIS DISPLACEMENT

TEST NUMBER 940613-3

CRASH III DAMAGE ALGORITHM

TRC INC



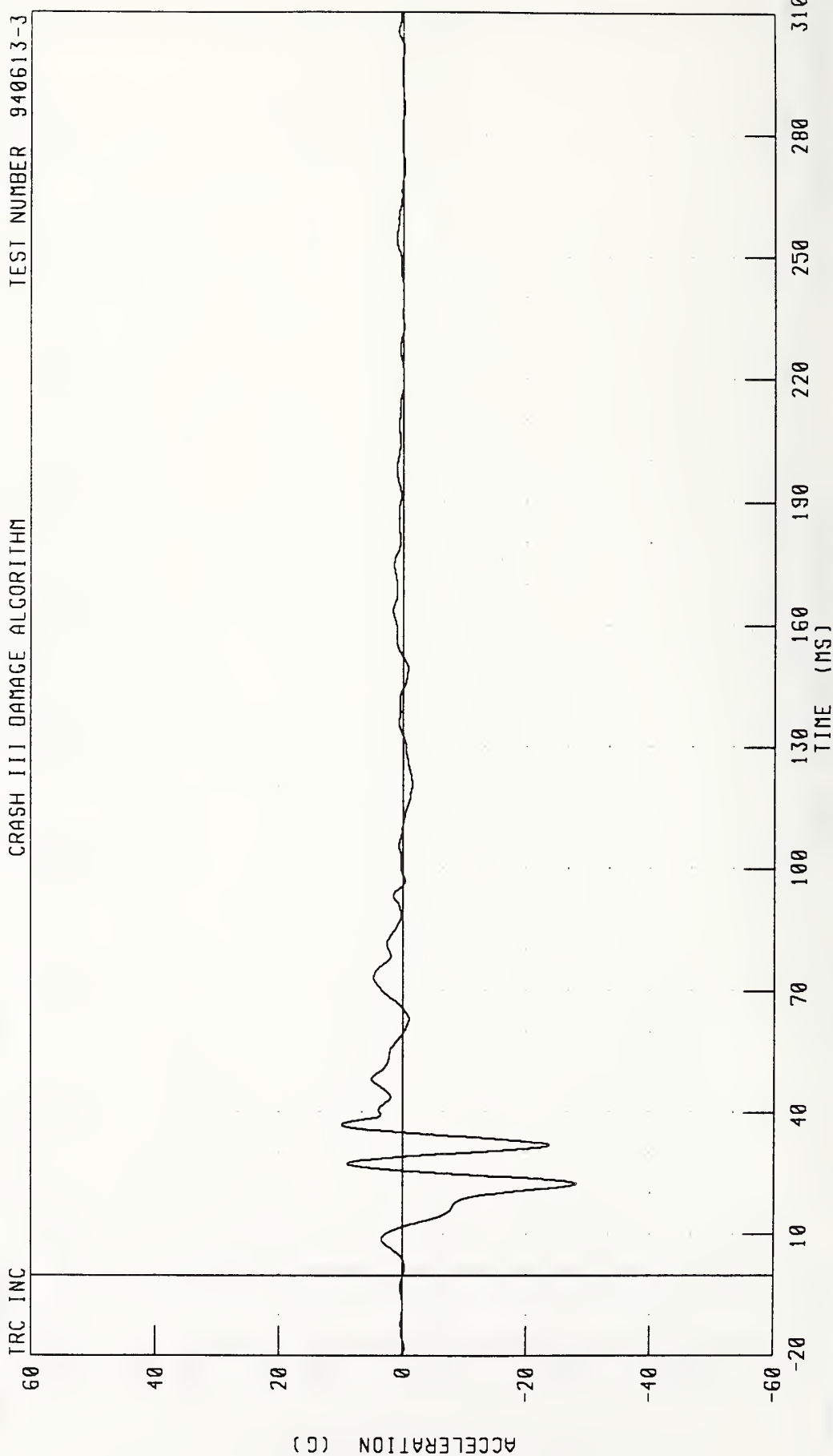
CHANNEL VCGXD1 FILTER CH CLASS 180 PEAK DATA 230 15 MM @ 74 16 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3



CHANNEL: VCGY61 FILTER: CH CLASS 60

PEAK DATA: 9 91 G @ 37 04 MS, -28 07 G @ 22 48 MS

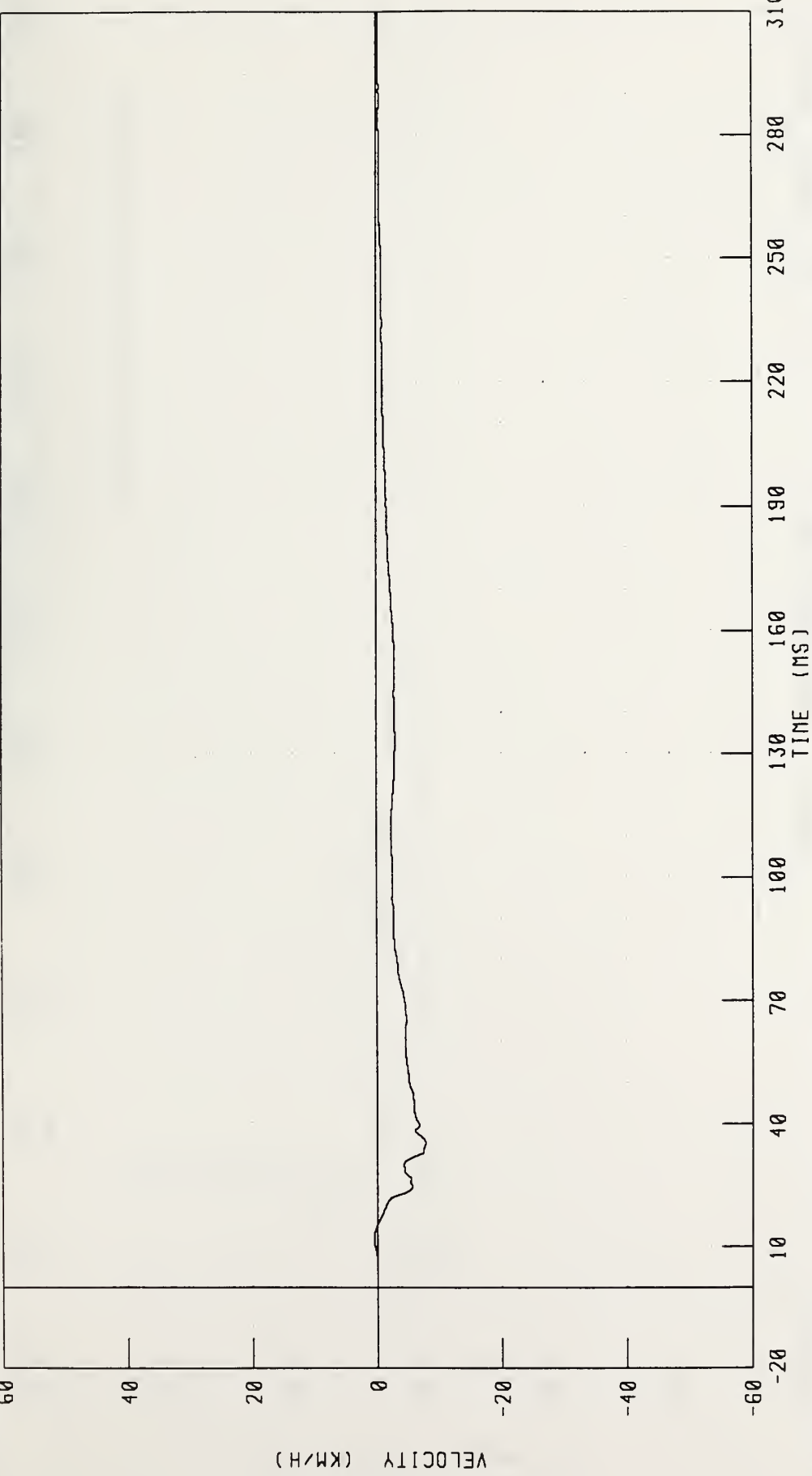
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

IRC INC



CHANNEL VCGYV1 FILTER: CH CLASS 180

PEAK DATA: 0.54 KM/H @ 12.48 MS, -7.81 KM/H @ 35.36 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

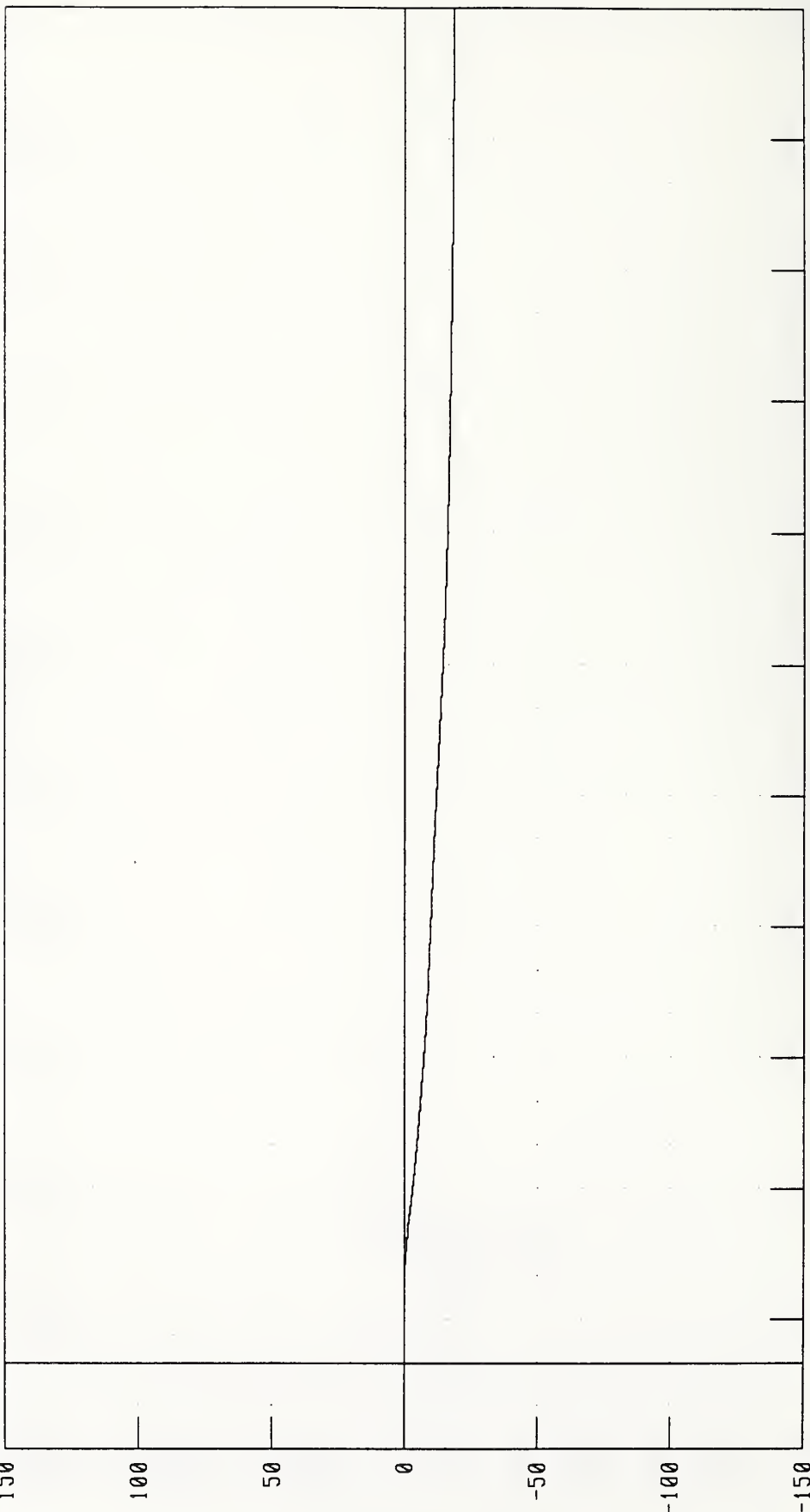
VEHICLE CC Y-AXIS DISPLACEMENT

TRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

DISPLACEMENT (MM X 10<sup>-1</sup>)



CHANNEL: VCCYD1 FILTER: CH CLASS 180

TIME (MS)

PEAK DATA: 0 74 MM @ 15.28 MS, -185 95 MM @ 310 00 MS

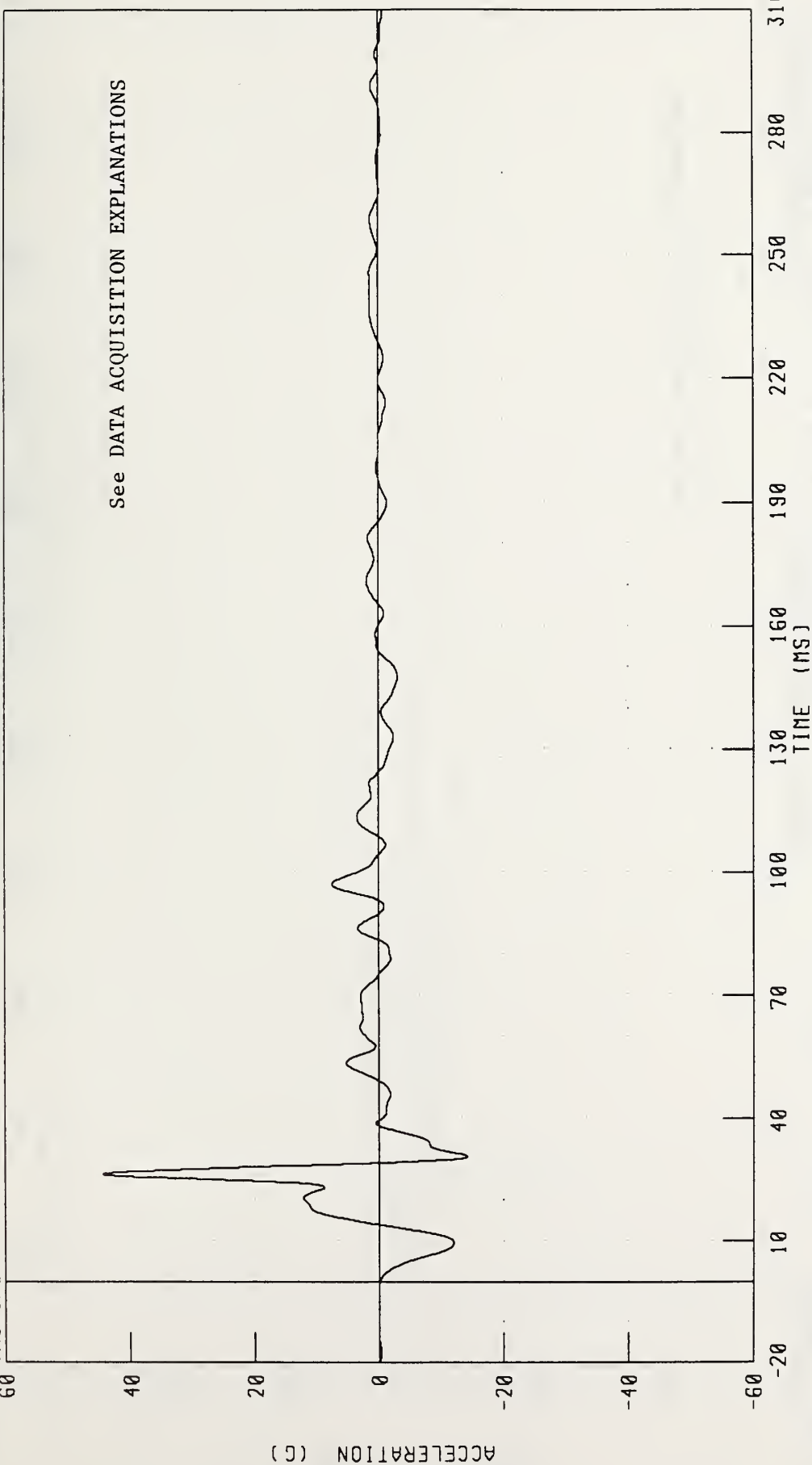
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



CHANNEL VCC7G1 FILTER CH CLASS 60

PEAK DATA 44 40 G @ 26 32 MS, -14 23 G @ 30 64 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC Z-AXIS VELOCITY

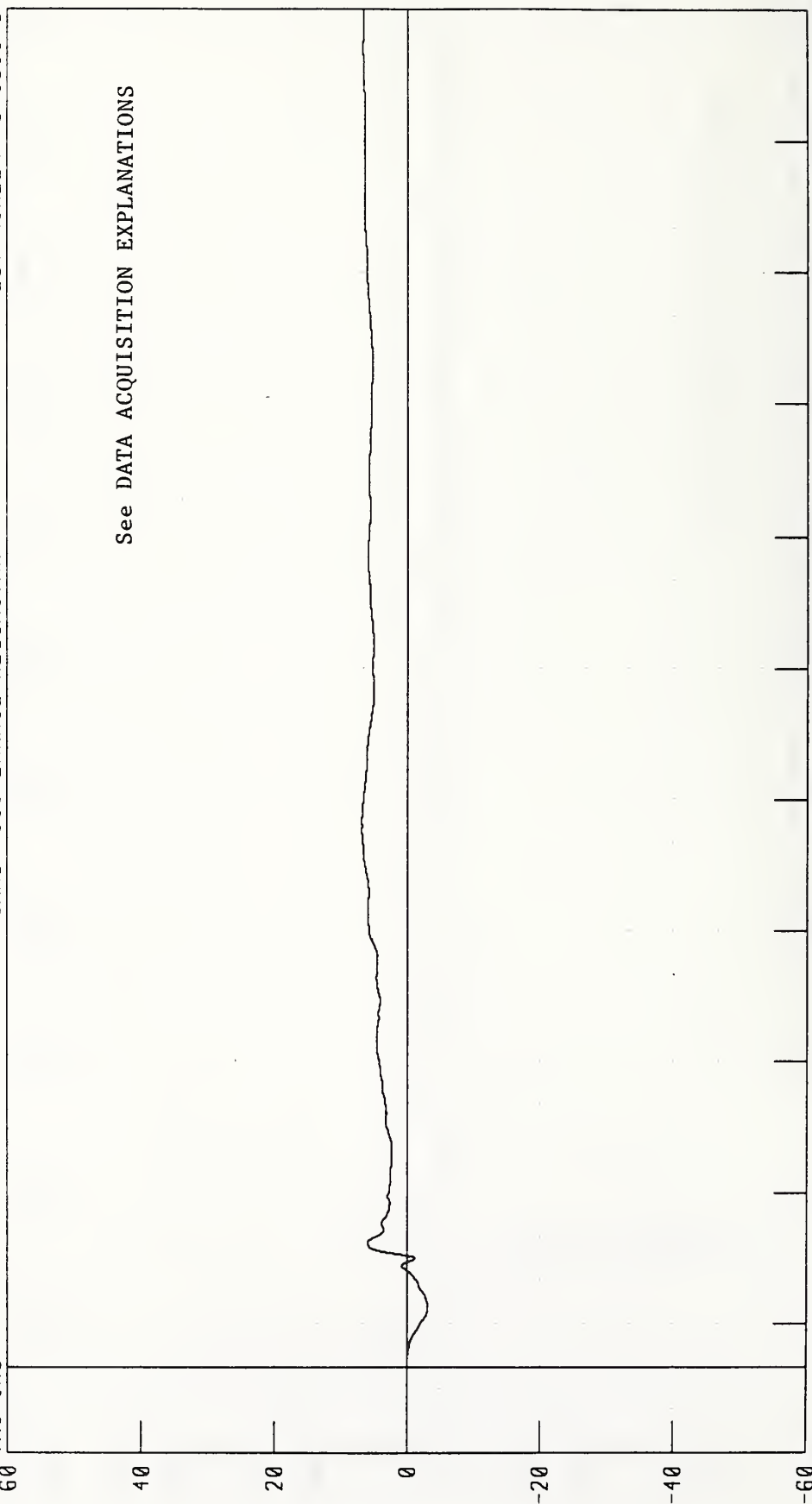
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

IRC INC

See DATA ACQUISITION EXPLANATIONS

VELOCITY (KM/H)



CHANNEL VCGZV1 FILTER CH CLASS 180

PEAK DATA: 6 92 KM/H @ 122 80 MS, -3 08 KM/H @ 13 76 MS

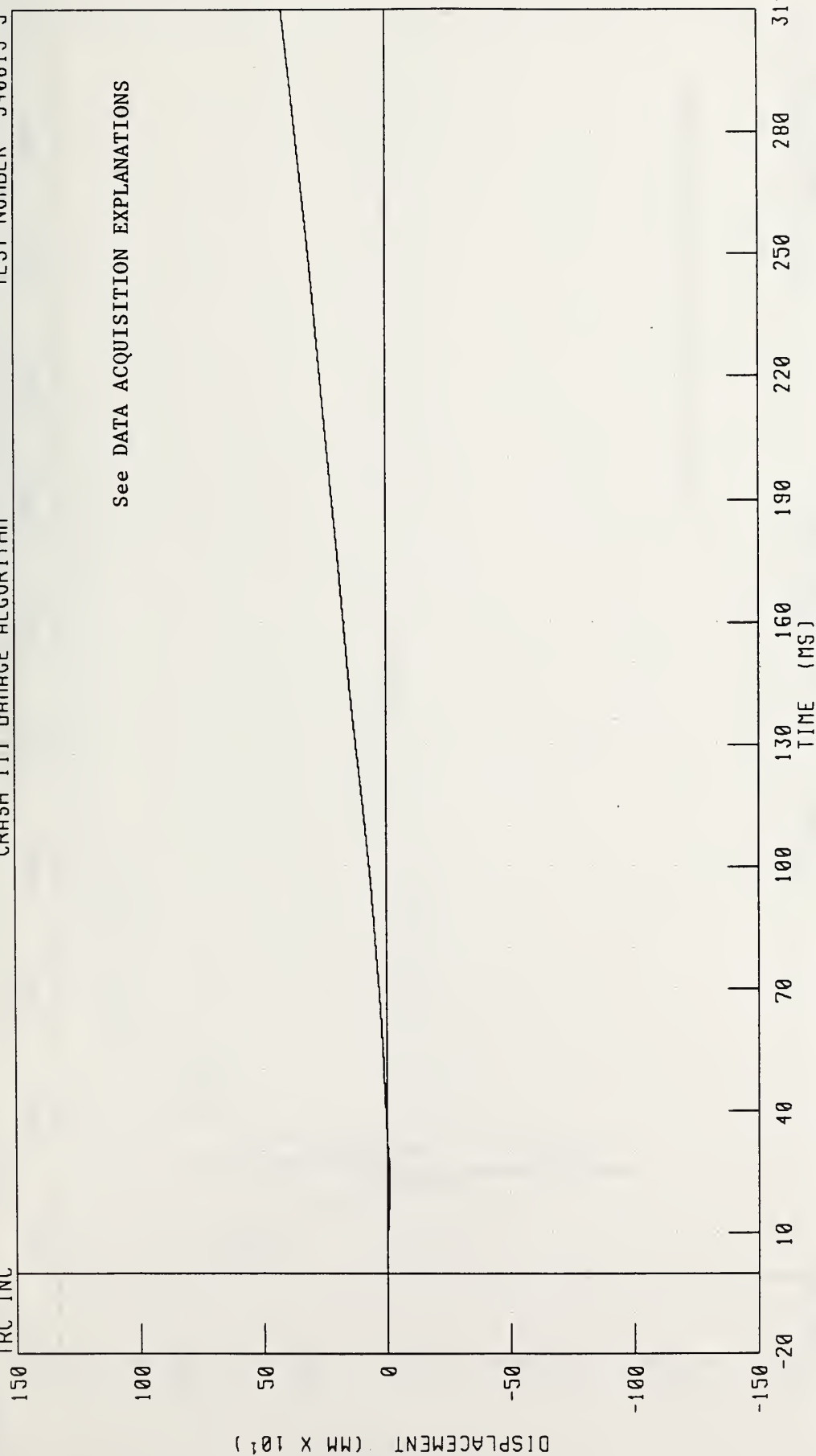
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



CHANNEL VCGZD1 FILTER CH CLASS 180

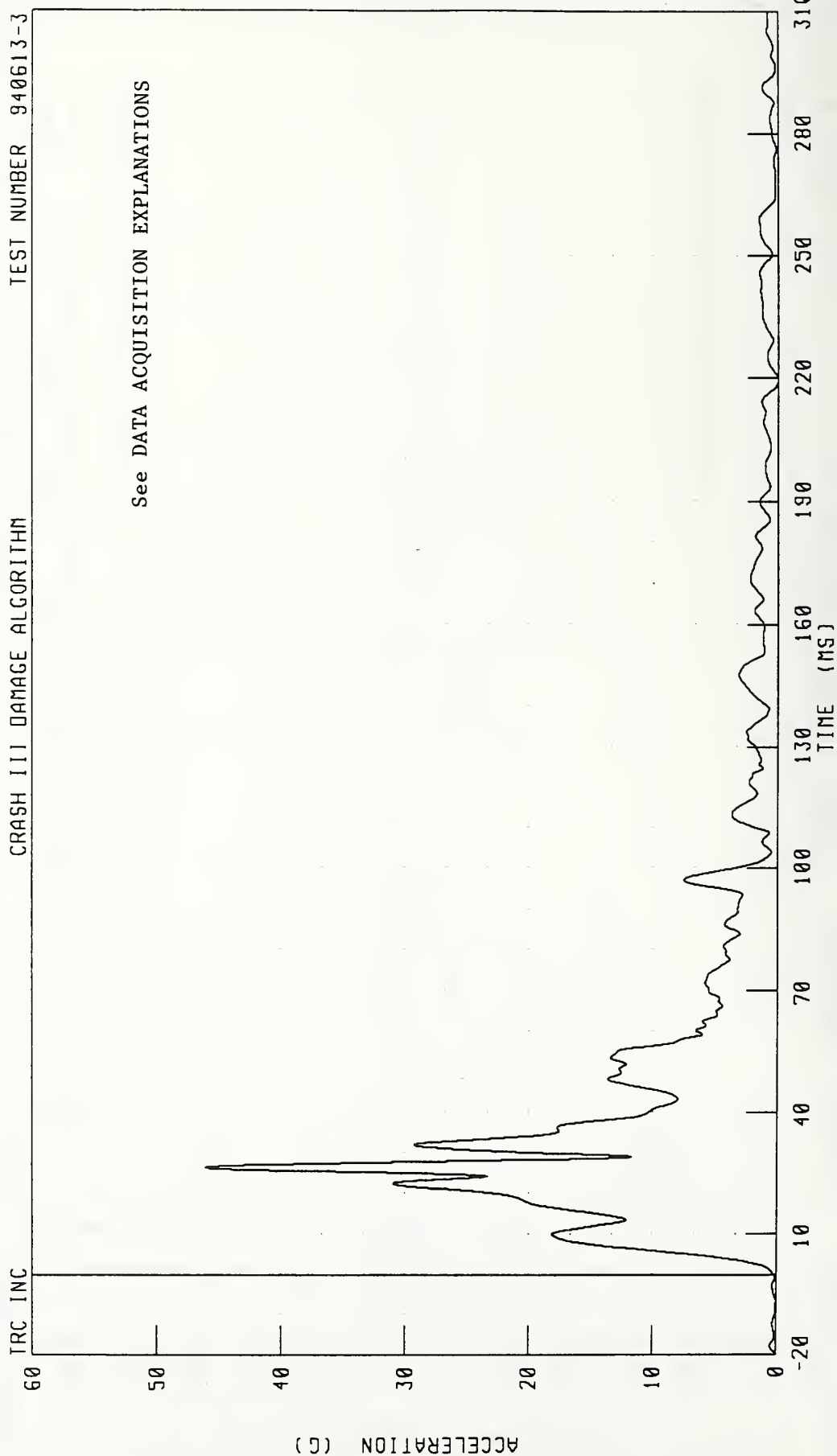
PEAK DATA: 418 07 MM @ 310 00 MS, -8 90 MM @ 25 76 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC RESULTANT ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3



CHANNEL VCGR1 FILTER CH CLASS 60

PEAK DATA 46 09 G @ 26 32 MS, 0 04 G @ 219 92 MS

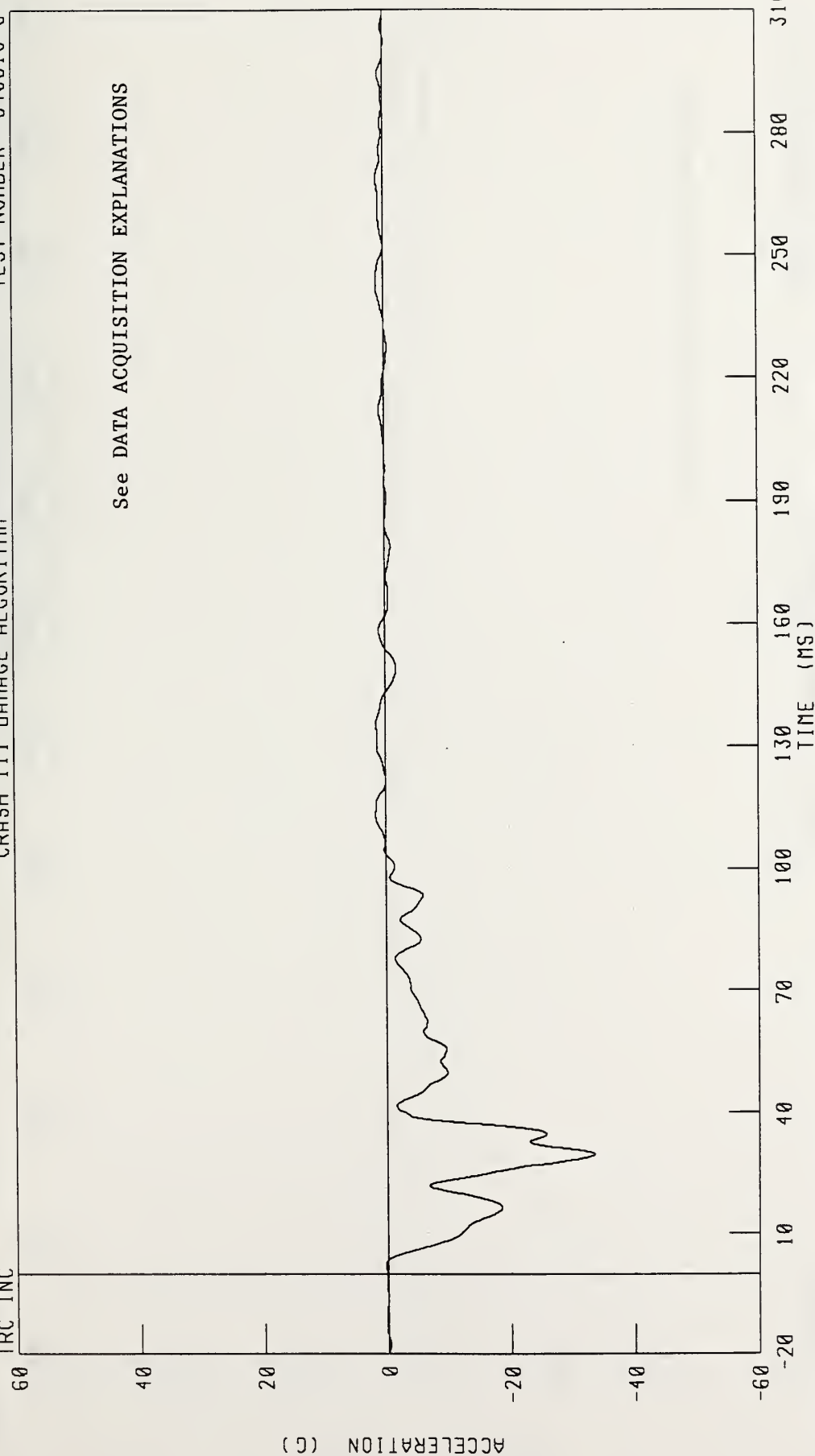
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

IRC INC



See DATA ACQUISITION EXPLANATIONS

CHANNEL LRSXC1 FILTER CH CLASS 60

PEAK DATA 1 65 G @ 113 04 MS, -33 46 G @ 29 68 MS

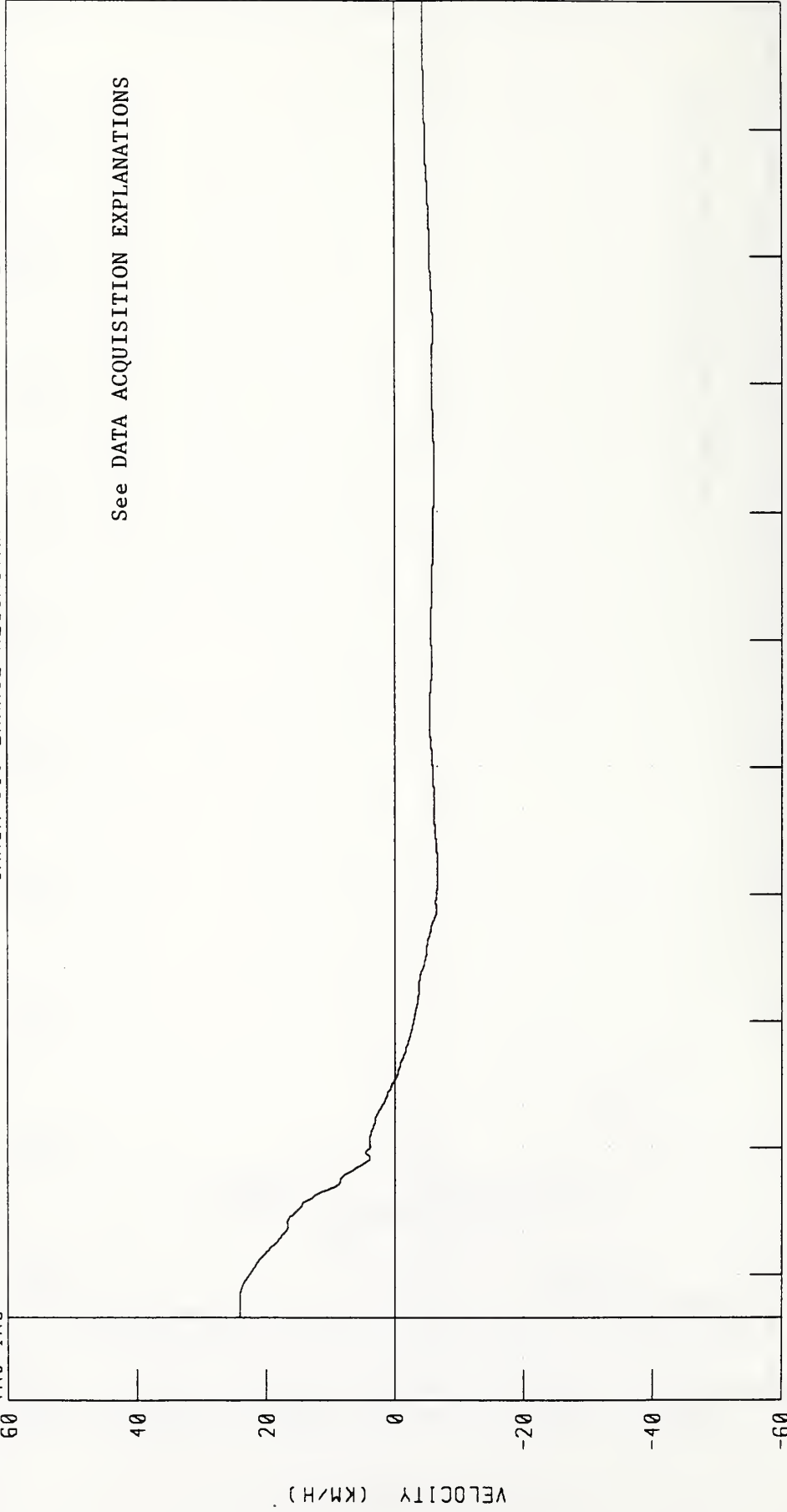
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



See DATA ACQUISITION EXPLANATIONS

TIME (MS)

CHANNEL LRSXV1 FILTER CH CLASS 180

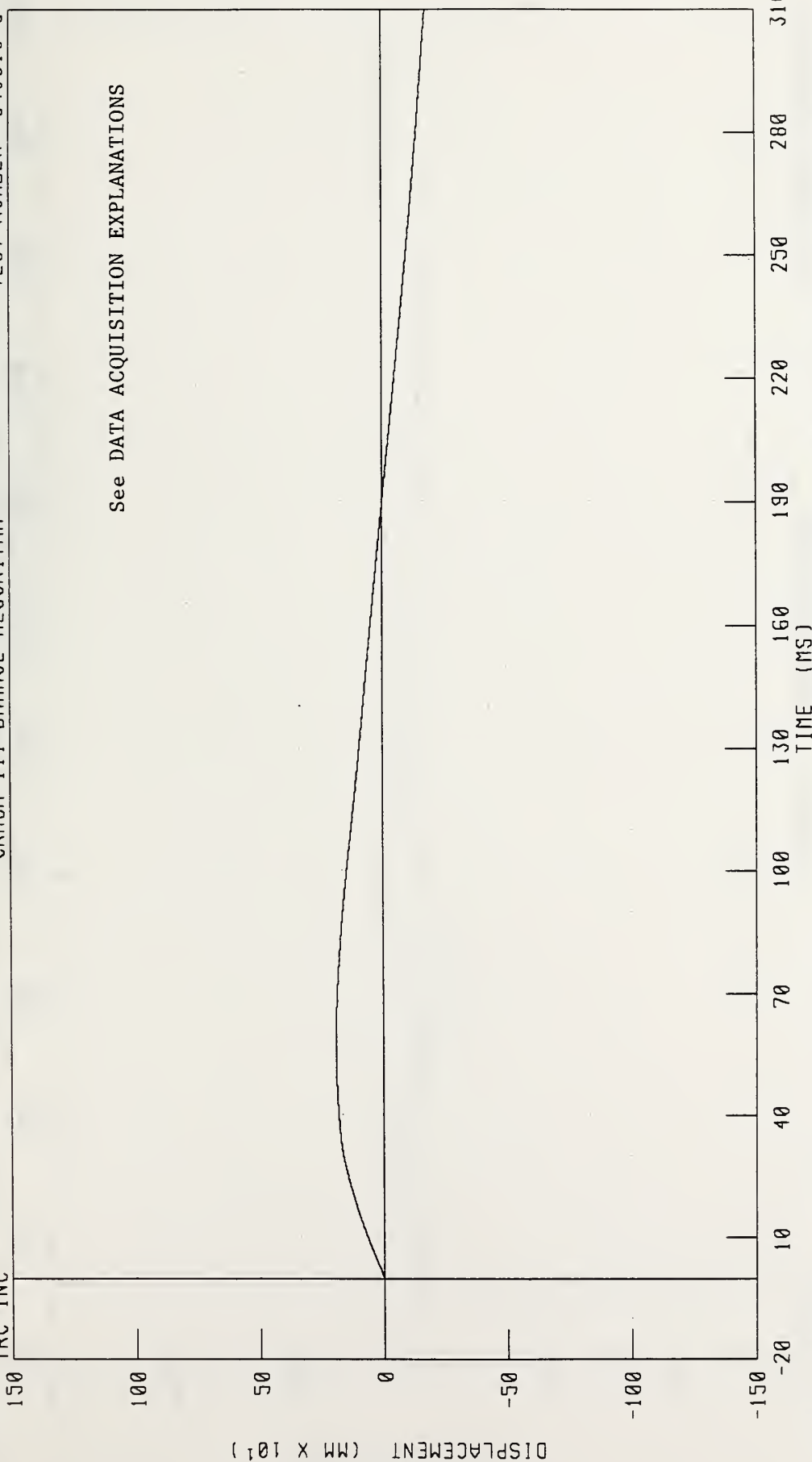
PEAK DATA 24 14 KM/H @ 4 16 MS, -6 63 KM/H @ 102 80 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



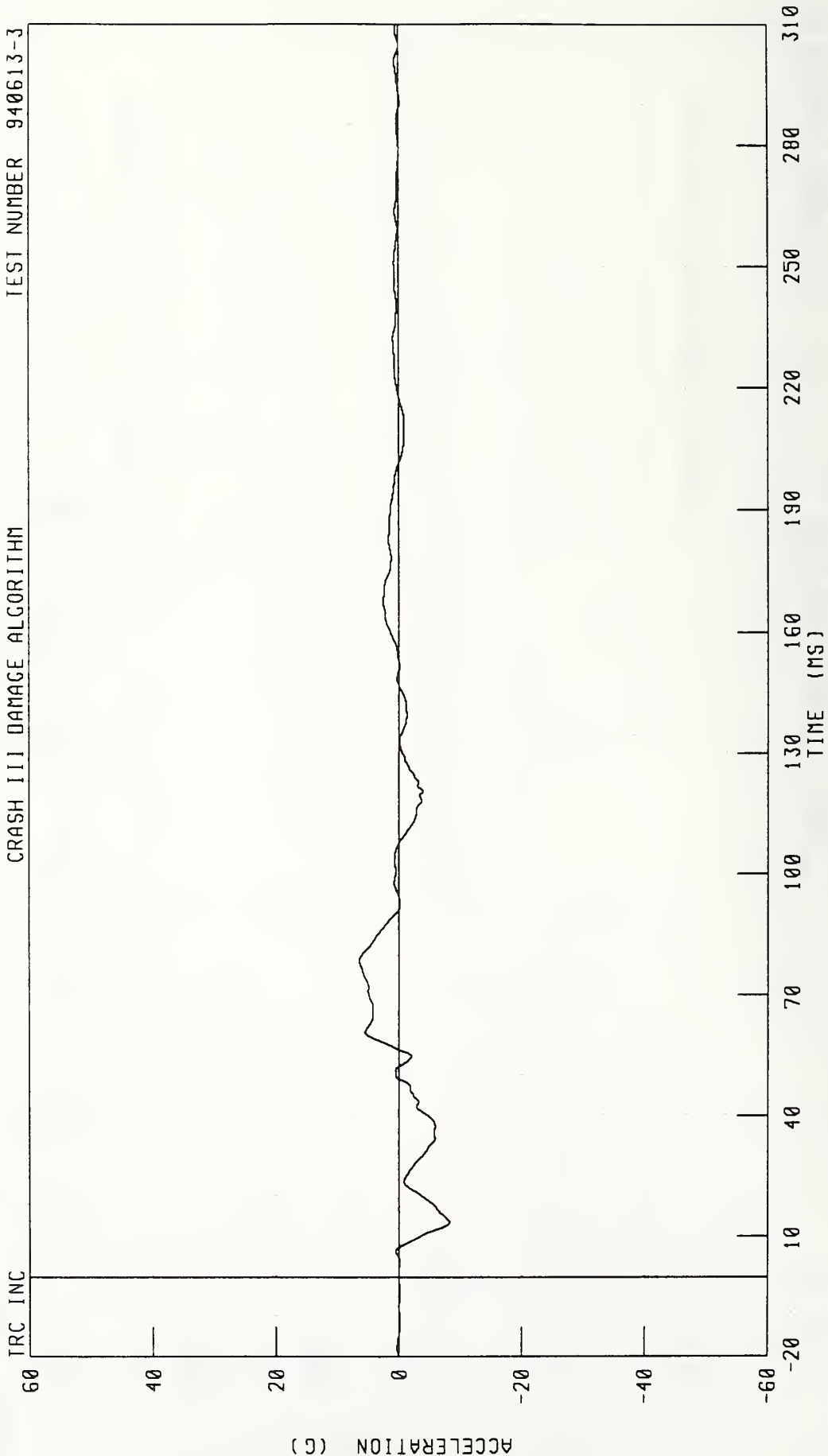
CHANNEL: LRSXD1 FILTER CH CLASS 180

PEAK DATA 192 42 MM @ 56 16 MS, -176 62 MM @ 310 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-3



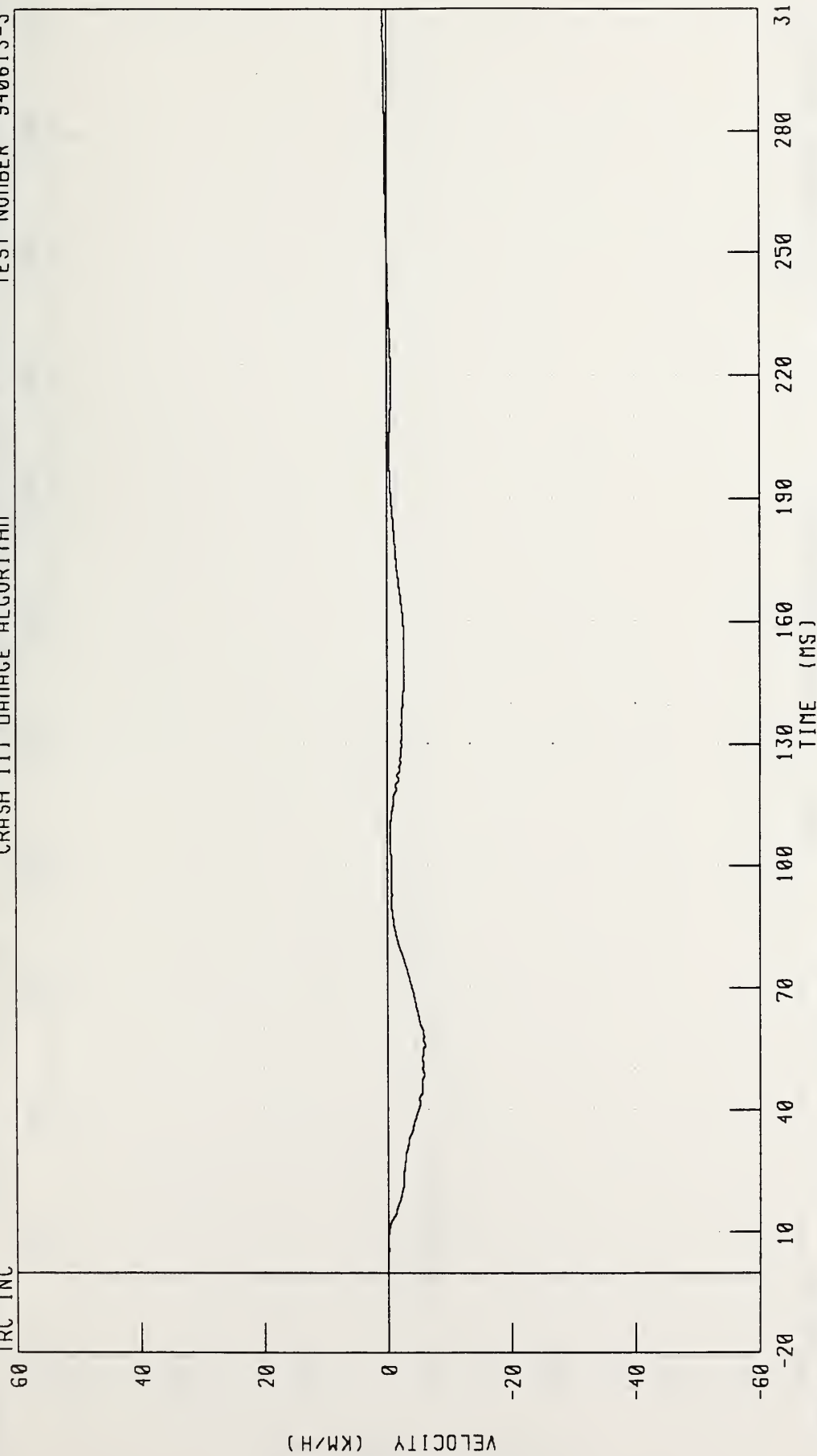
CHANNEL: LRSYG1 FILTER: CH CLASS 60

PEAK DATA: 6.39 G @ 78.56 MS; -8.27 G @ 13.60 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS VELOCITY  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC

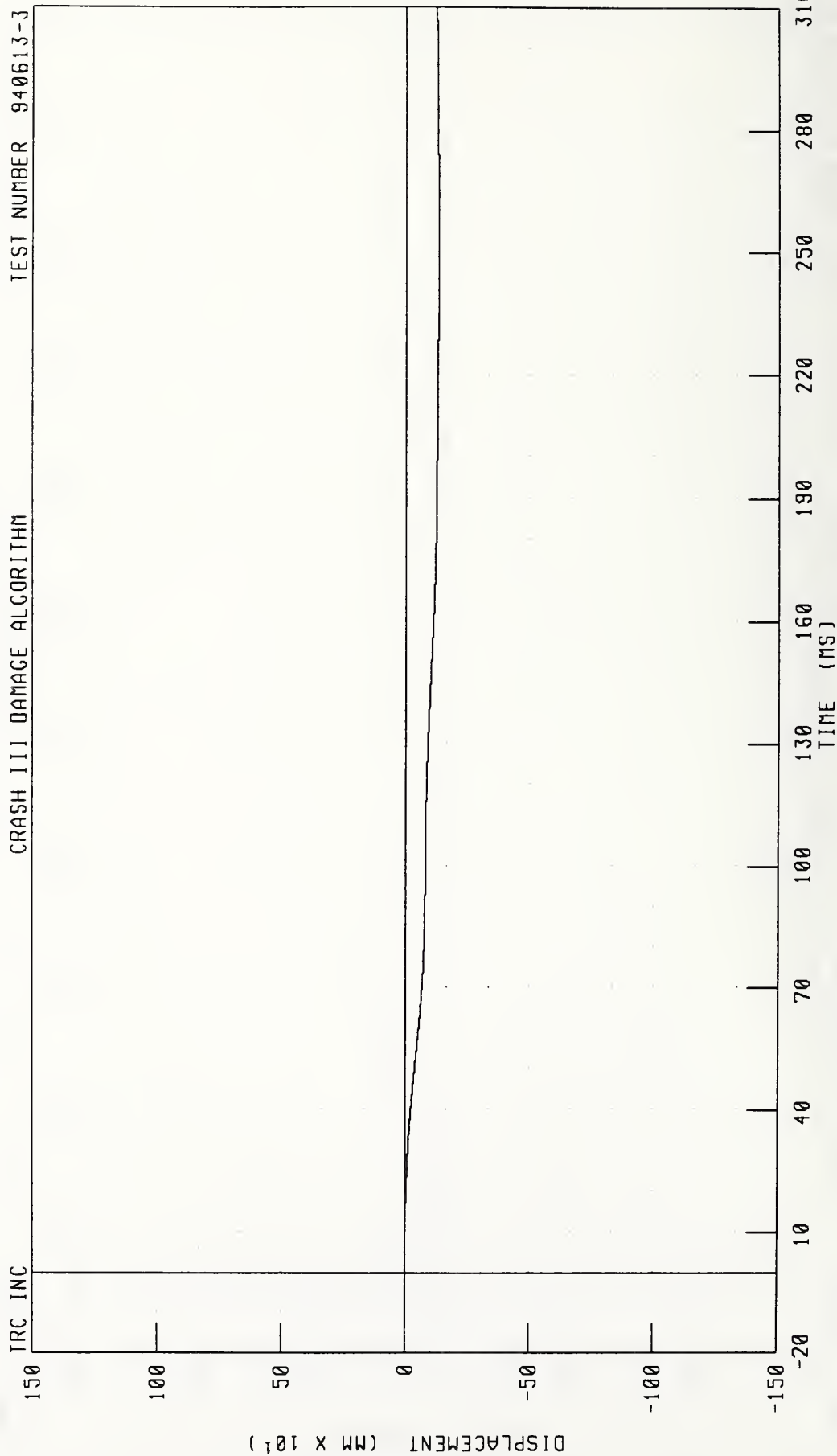


CHANNEL LRSYV1 FILTER CH CLASS 180

PEAK DATA 0 69 KM/H @ 310 00 MS, -6 05 KM/H @ 55 92 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-3



CHANNEL LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0 03 MM @ 9 04 MS, -130 30 MM @ 250 32 MS

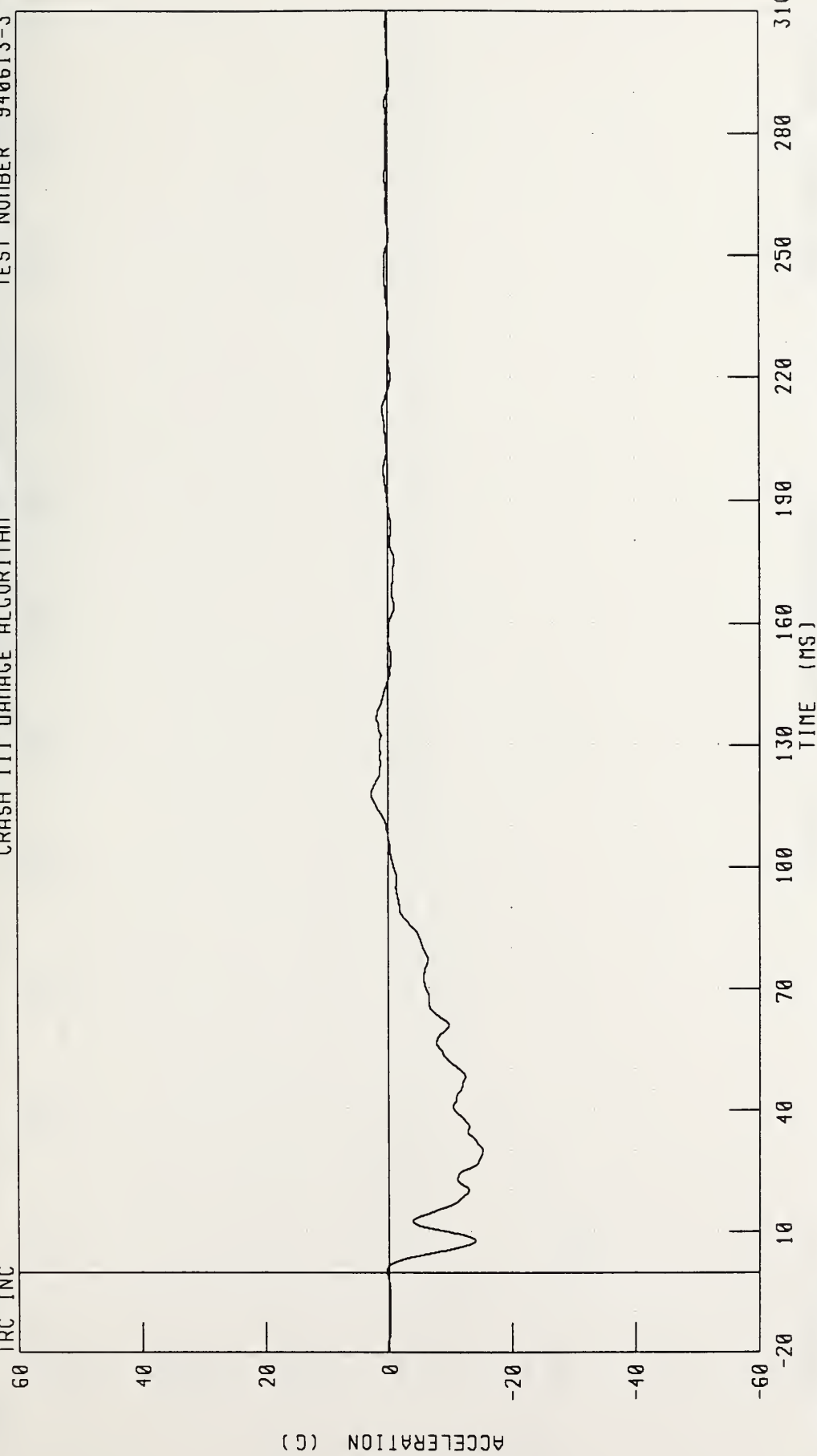
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



CHANNEL RRSXG1 FILTER: CH CLASS 60

PEAK DATA 2 70 G @ 118 00 MS, -15 25 G @ 29 84 MS

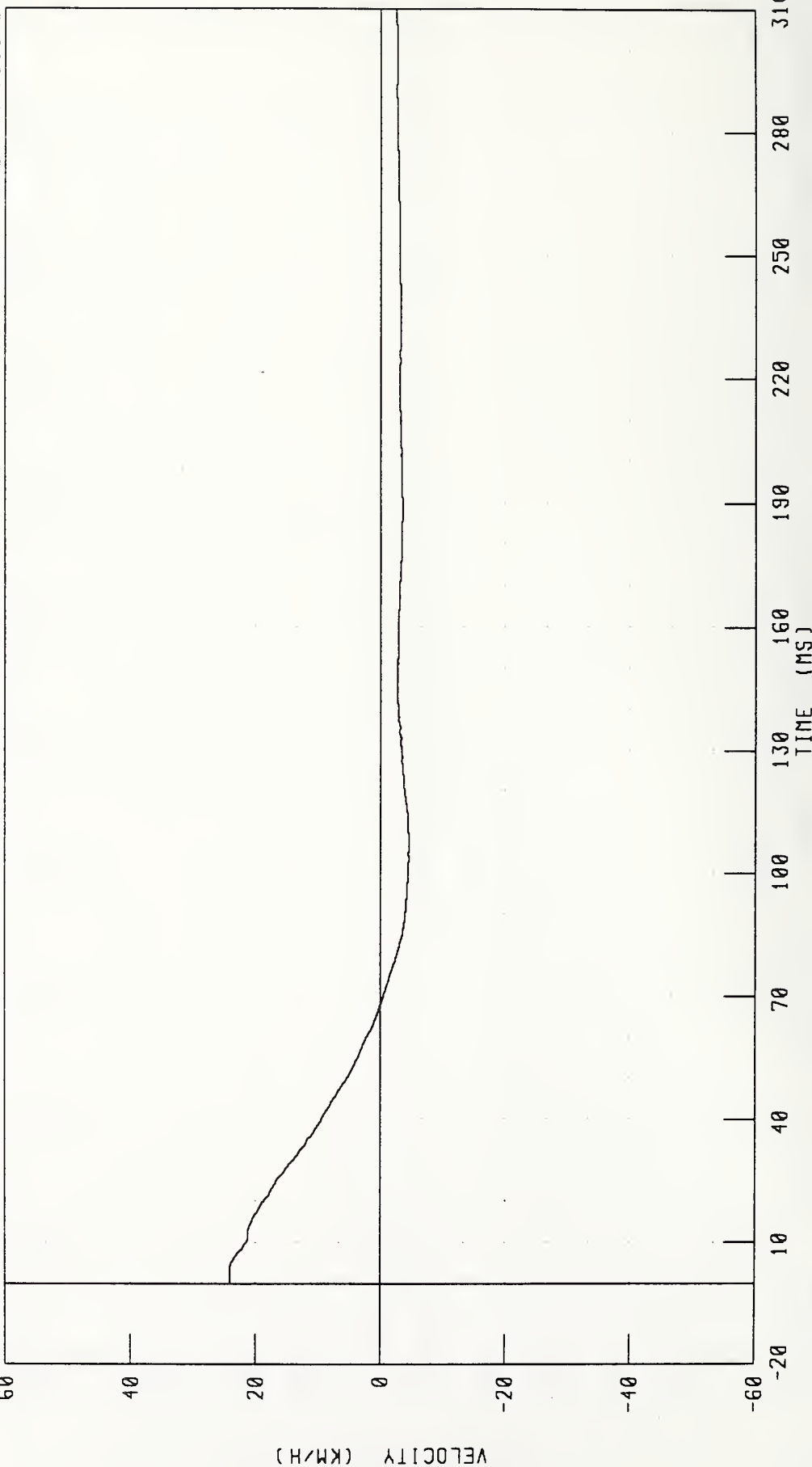
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS VELOCITY

TRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3



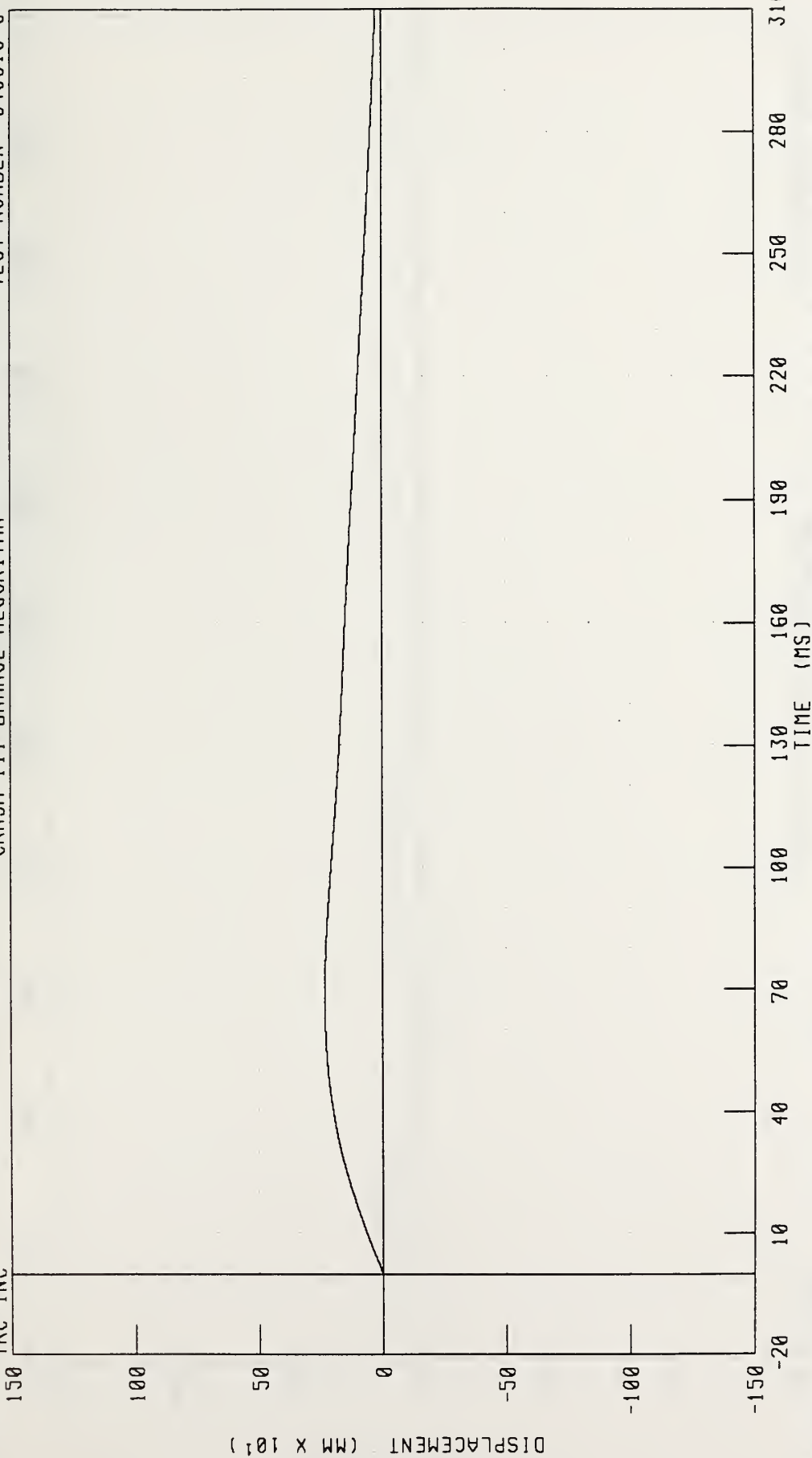
CHANNEL: RRSXV1 FILTER: CH CLASS 180

PEAK DATA: 24.11 KM/H @ 232 MS, -4.52 KM/H @ 106.32 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL X-AXIS DISPLACEMENT  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3

TRC INC



CHANNEL RRSXD1 FILTER CH CLASS 180

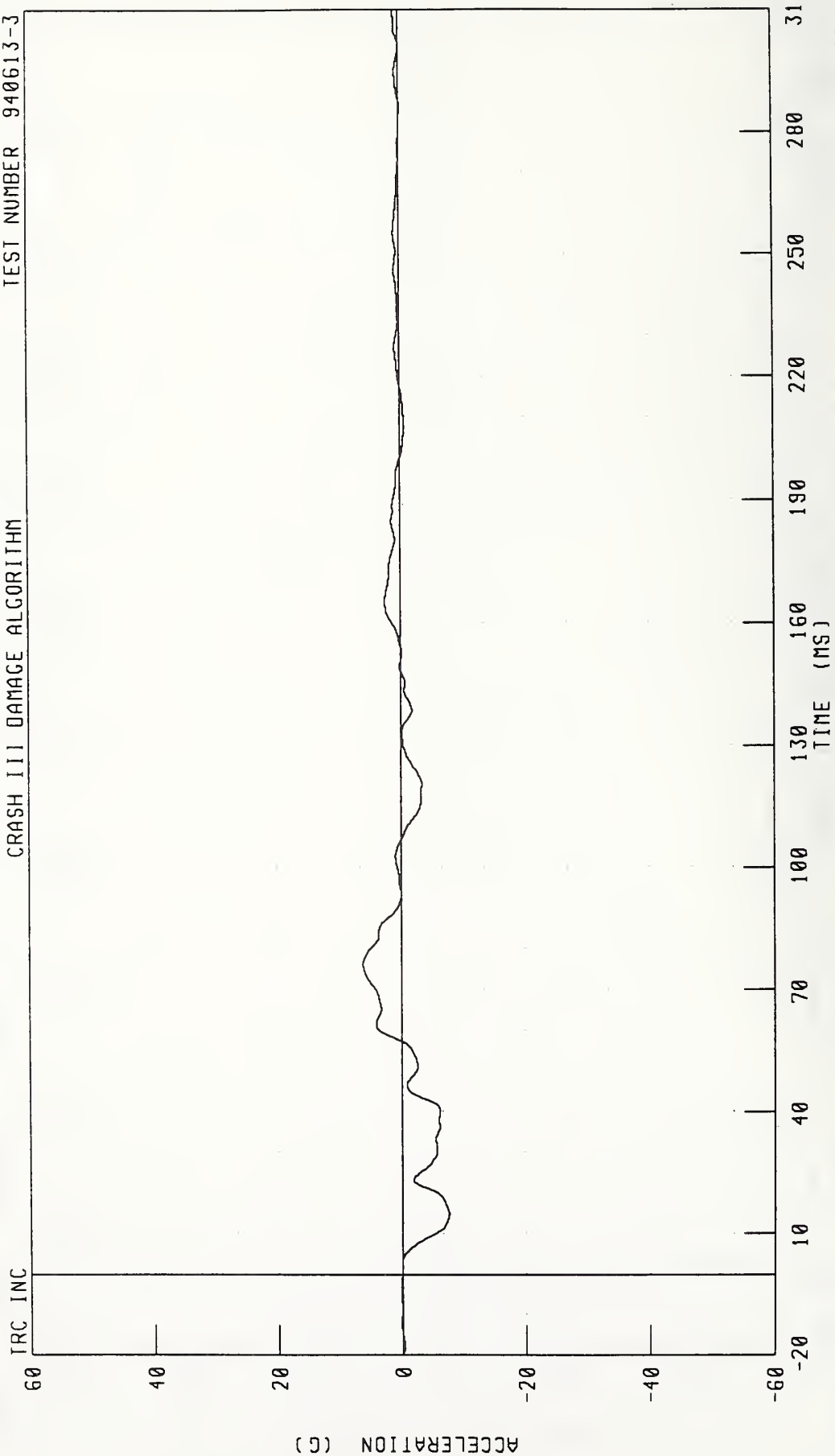
TIME (MS)

PEAK DATA: 233.41 MM @ 68.00 MS, 0.00 MM @ 0.00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-3



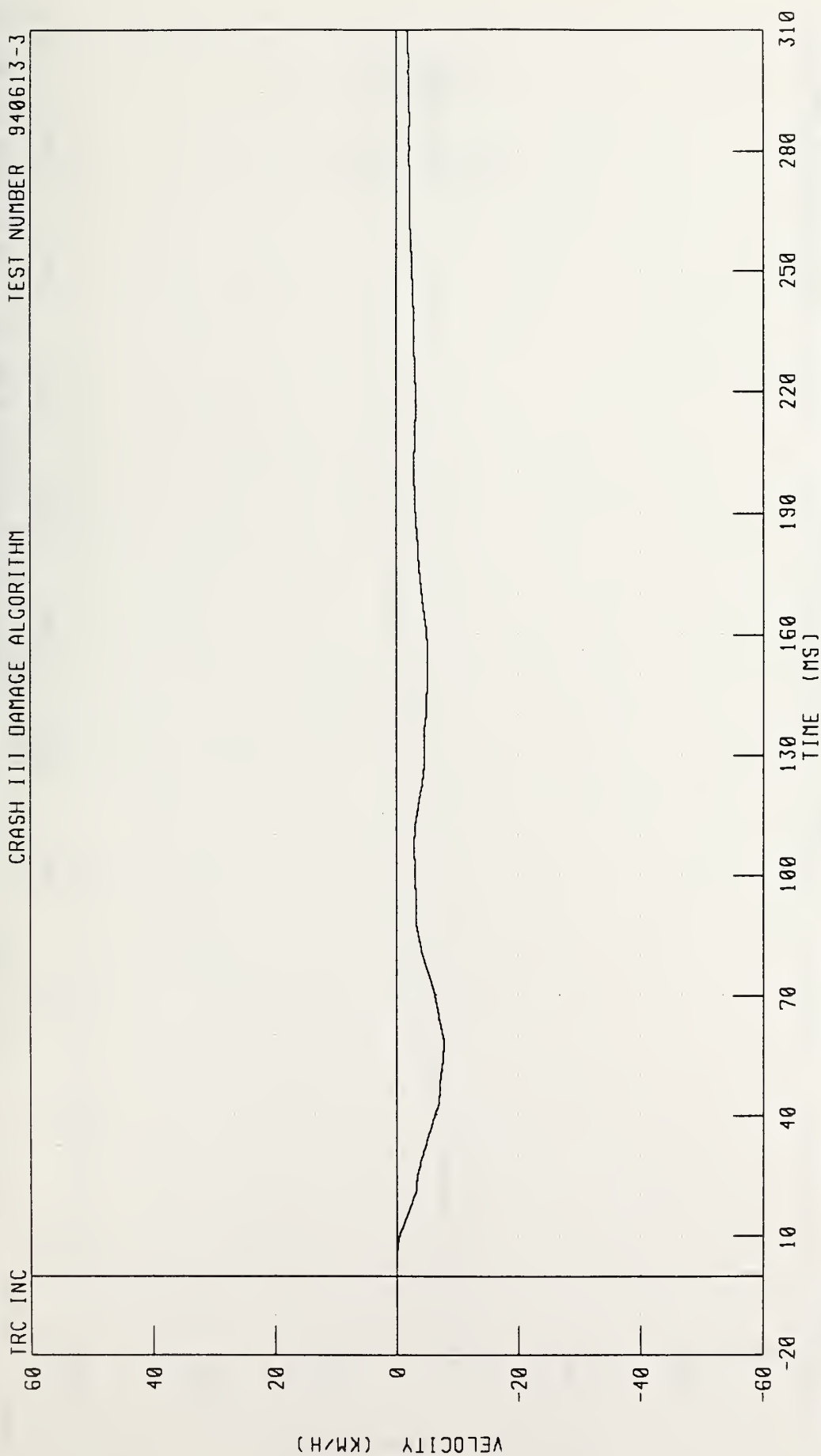
CHANNEL RRSYG1 FILTER CH CLASS 60 PEAK DATA 6 24 G @ 76.32 MS; -7.53 G @ 14.88 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-3



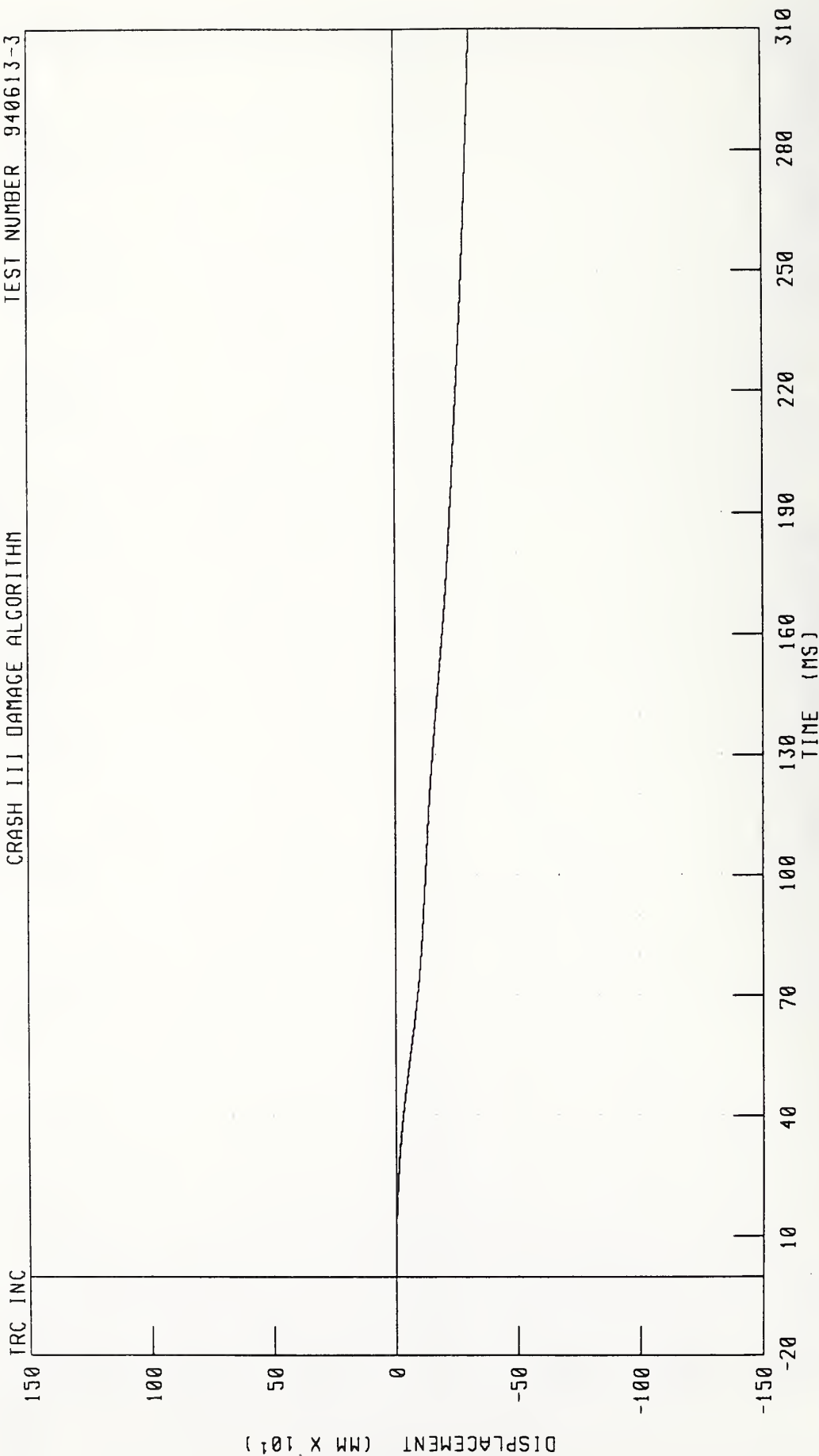
CHANNEL RRSYV1 FILTER CH CLASS 180

PEAK DATA: 0 00 KM/H @ 0 00 MS, -7 82 KM/H @ 57 92 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-3



CHANNEL RRSY01 FILTER: CH CLASS 180 PEAK DATA 0 00 MM @ 0 00 MS, -309 68 MM @ 310 00 MS

Data Plots

Test No. 940613-4



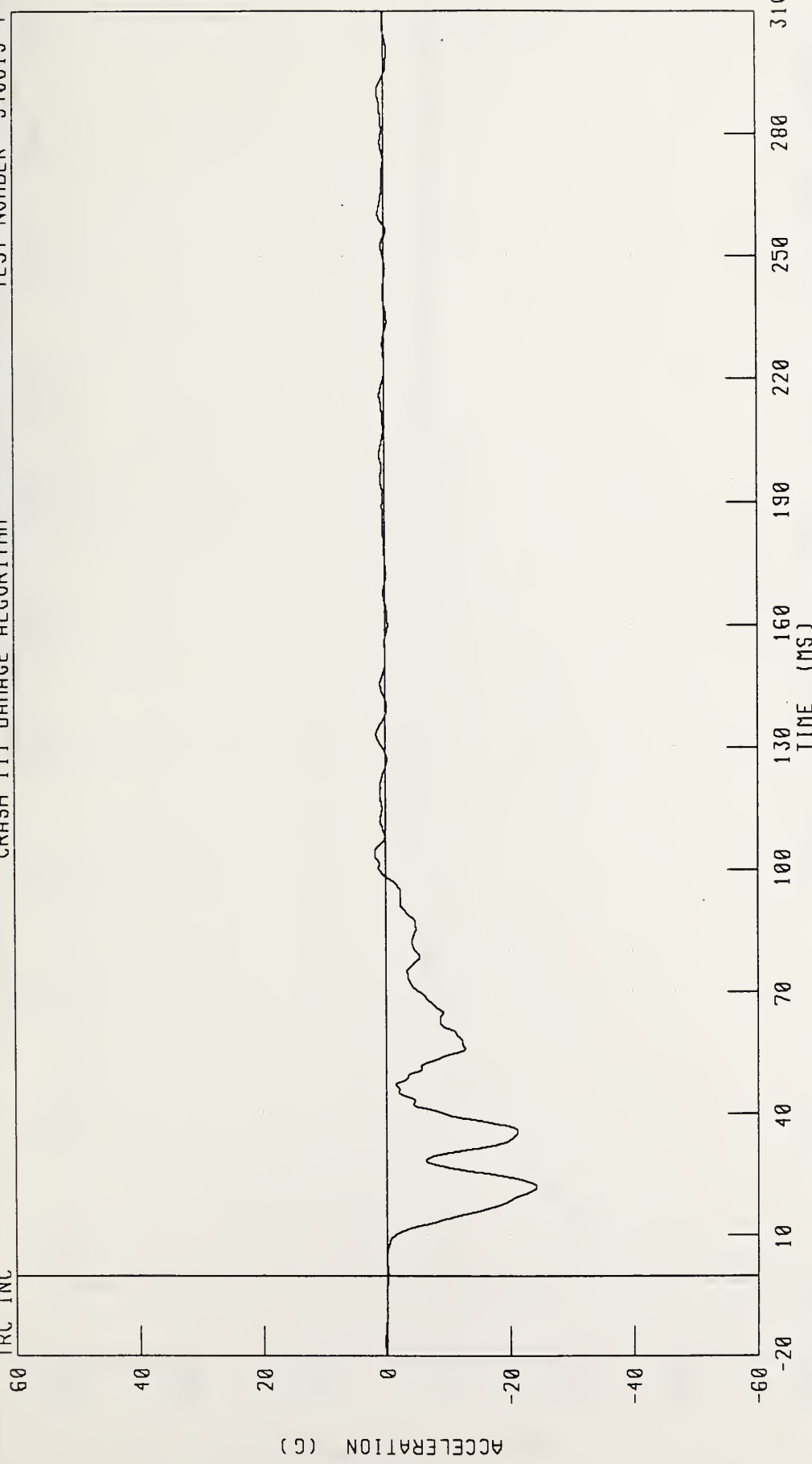
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC



CHANNEL VCGXG1 FILTER CH CLASS 60

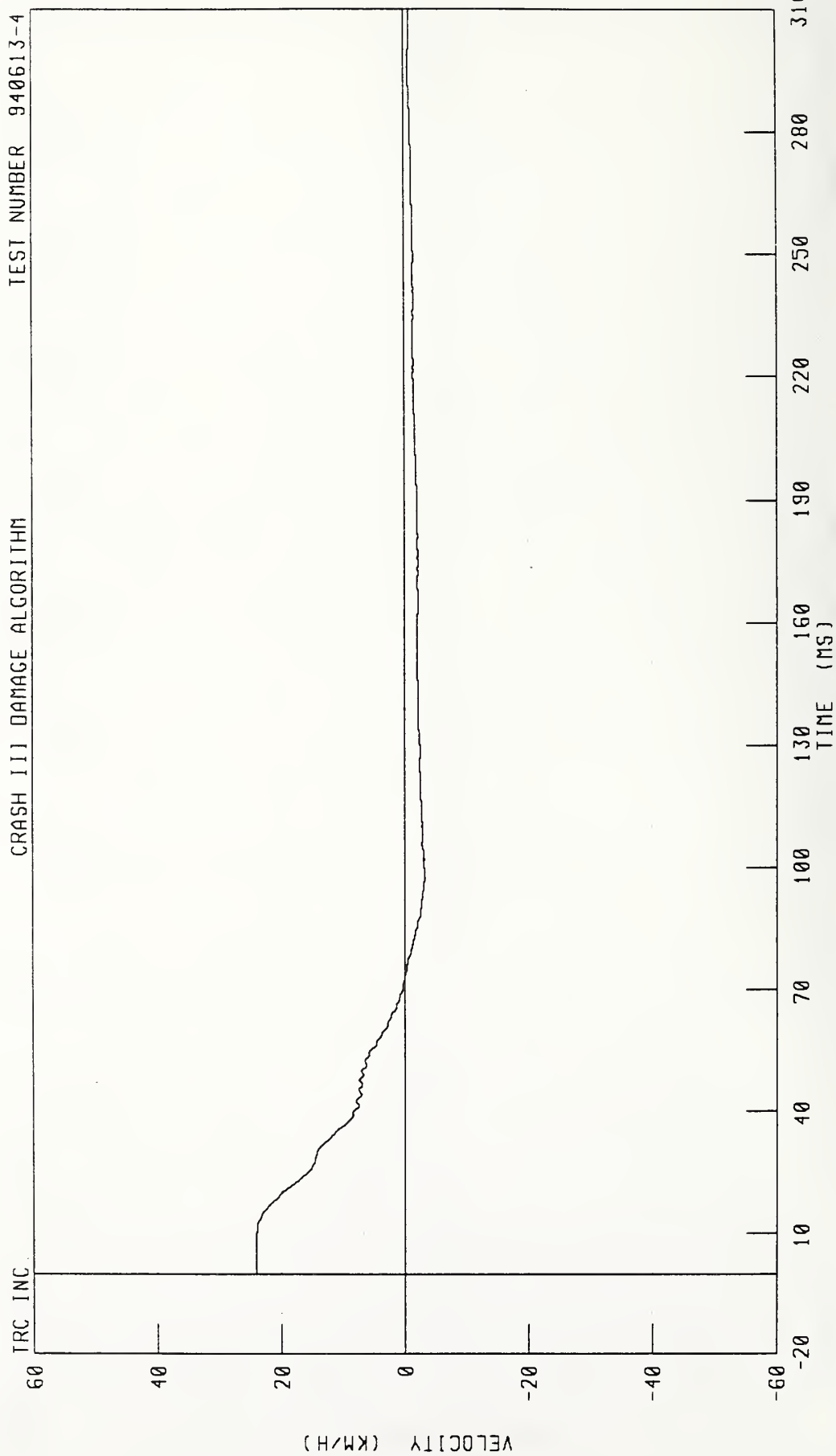
PEAK DATA 1 78 G @ 104 32 MS, -24 28 G @ 21 92 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



CHANNEL VCGXV1 FILTER CH CLASS 180

PEAK DATA 24 10 KM/H @ 0 00 MS, -3 24 KM/H @ 97 52 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC

150

100

50

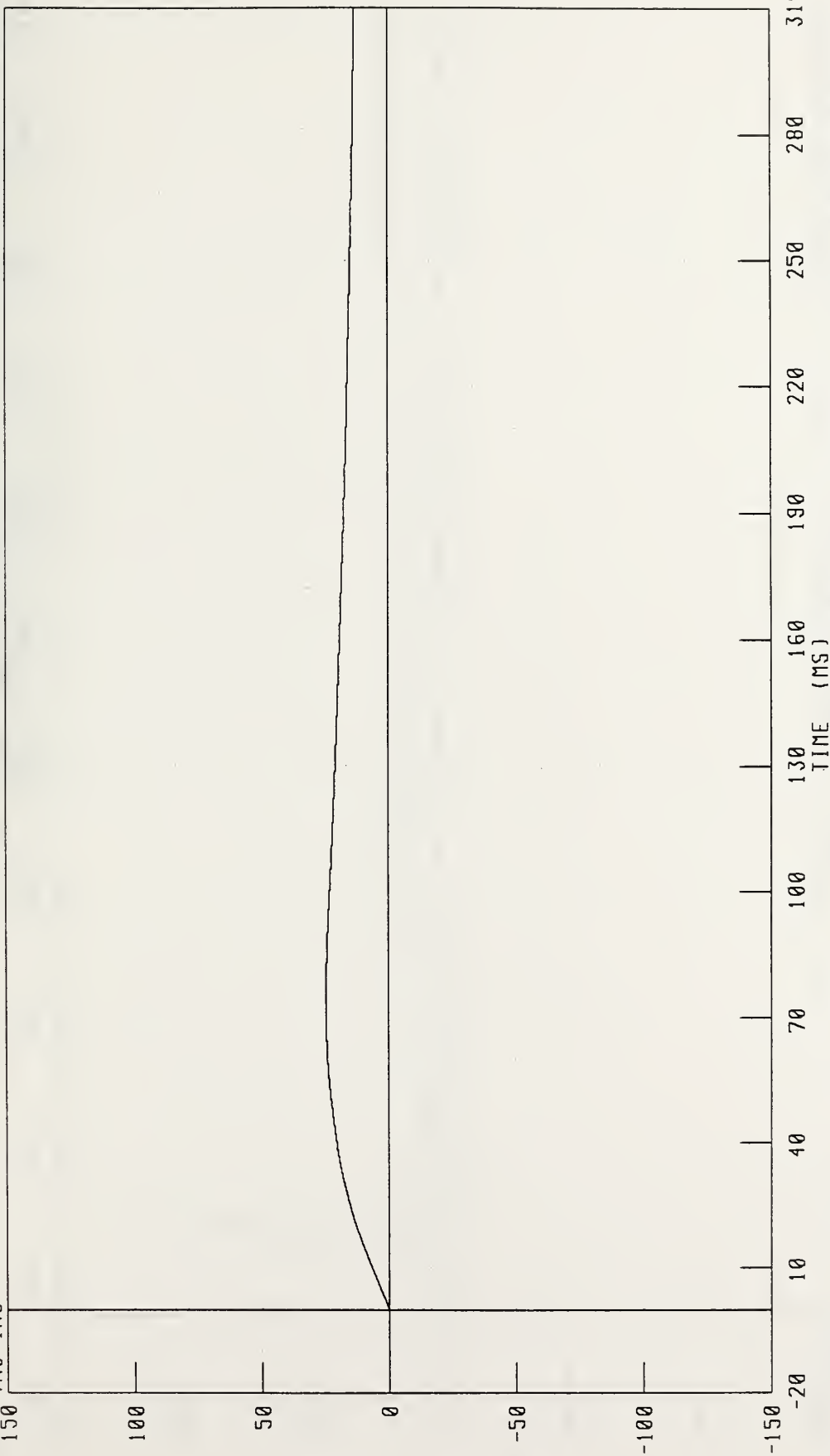
0

-50

-100

-150

DISPLACEMENT (MM X 10<sup>1</sup>)



CHANNEL VCGXD1 FILTER CH CLASS 180

PEAK DATA

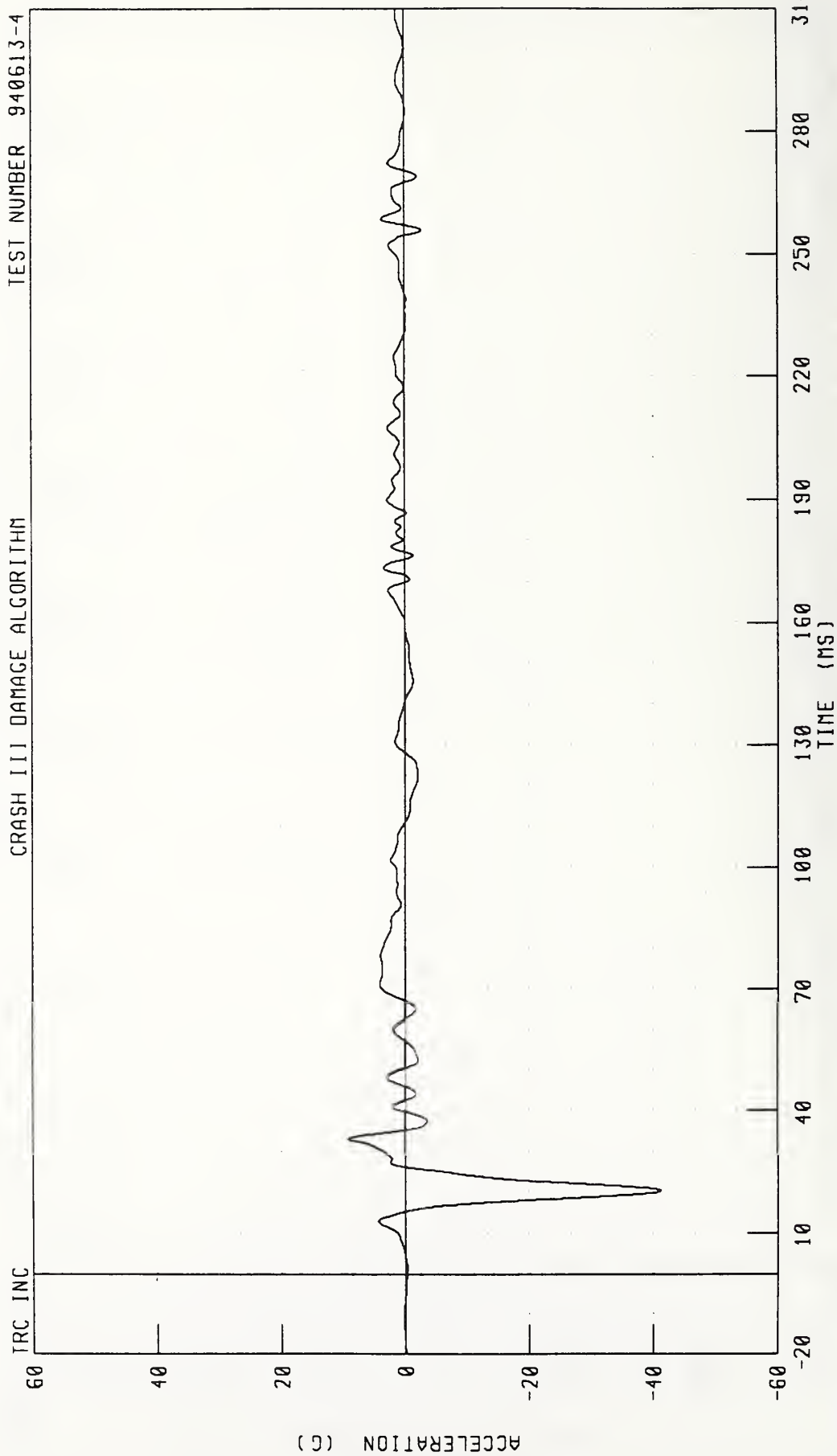
245 60 MM @ 73 28 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



CHANNEL: VCGY61 FILTER: CH CLASS 60

PEAK DATA: 9 18 G @ 33 12 MS, -41 14 G @ 20 48 MS

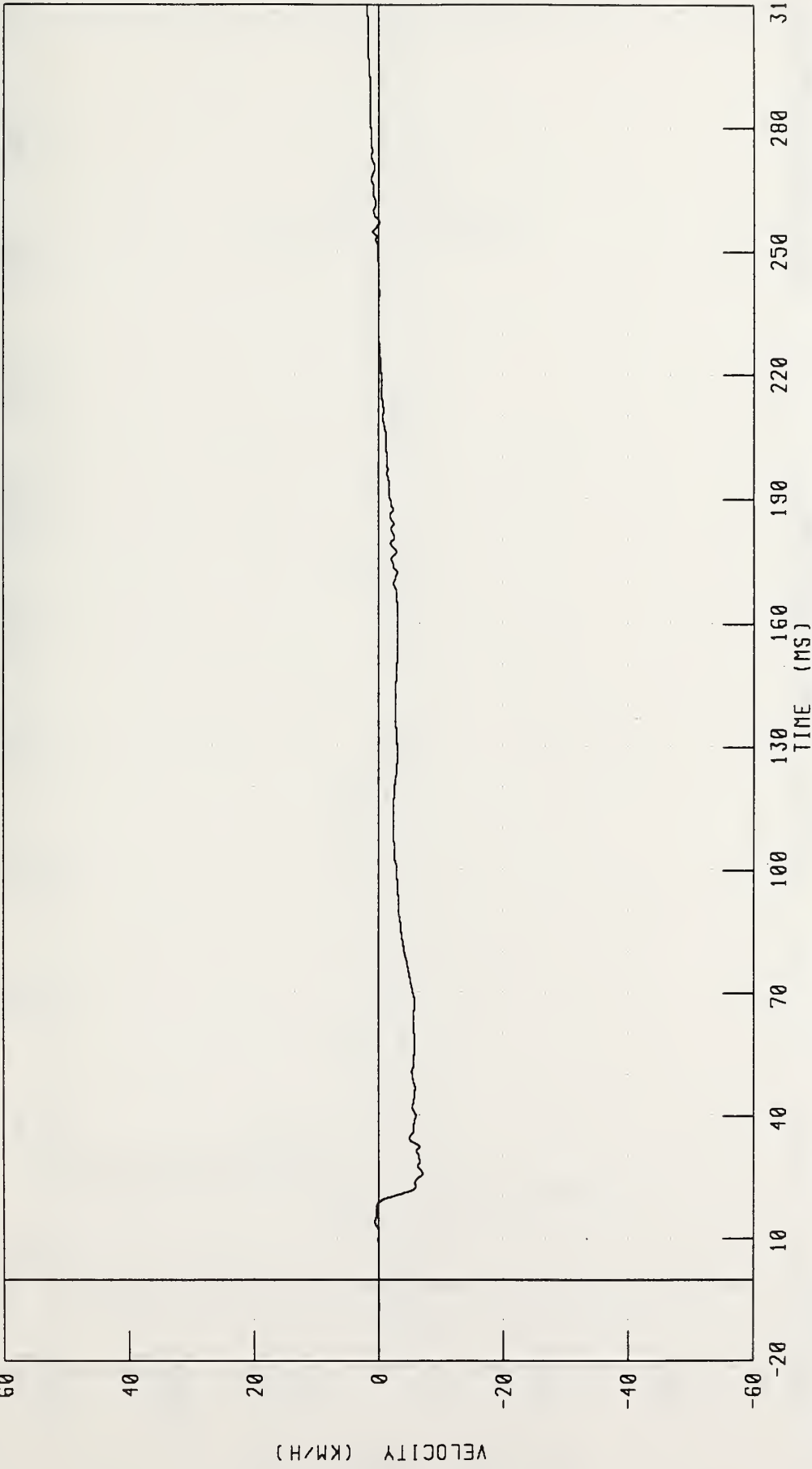
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC



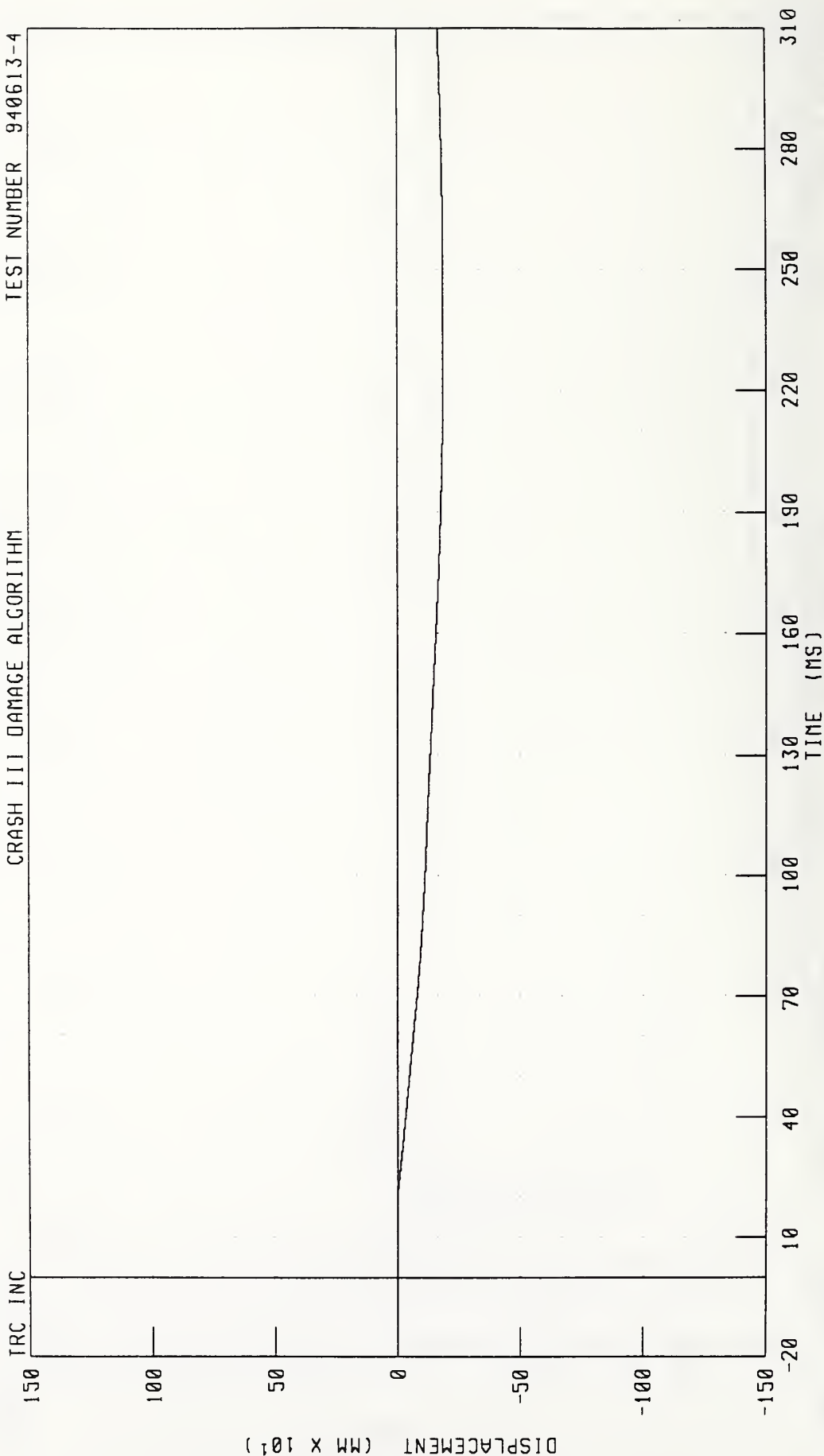
CHANNEL VCGYV1 FILTER: CH CLASS 180

PEAK DATA: 1 90 KM/H @ 309.28 MS; -7 10 KM/H @ 25.76 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4

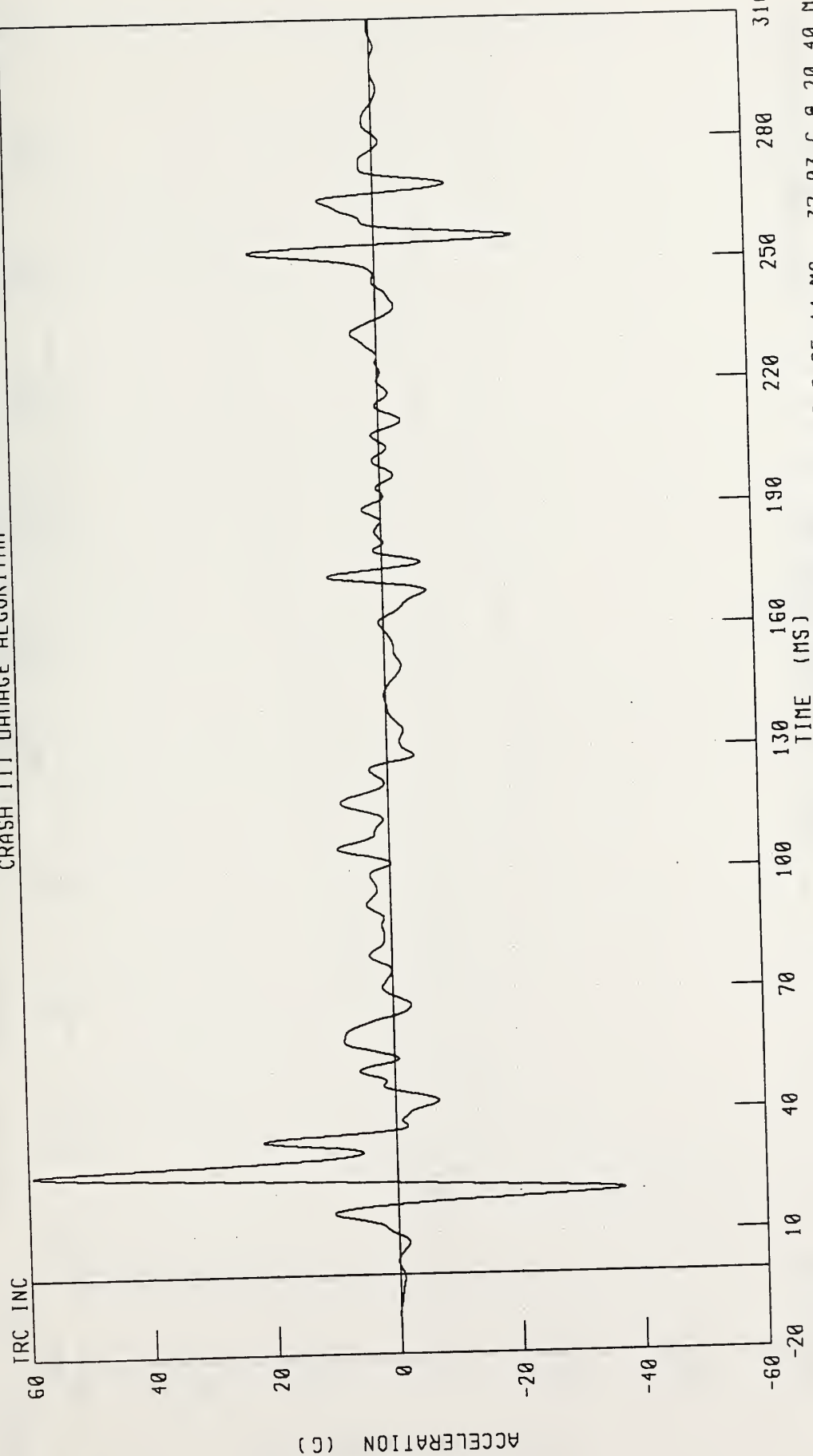


CHANNEL VCCYD1 FILTER: CH CLASS 180

PEAK DATA 0 69 MM @ 18 80 MS; -186 93 MM @ 244 64 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG Z-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



CHANNEL VCGZG1 FILTER CH CLASS 60

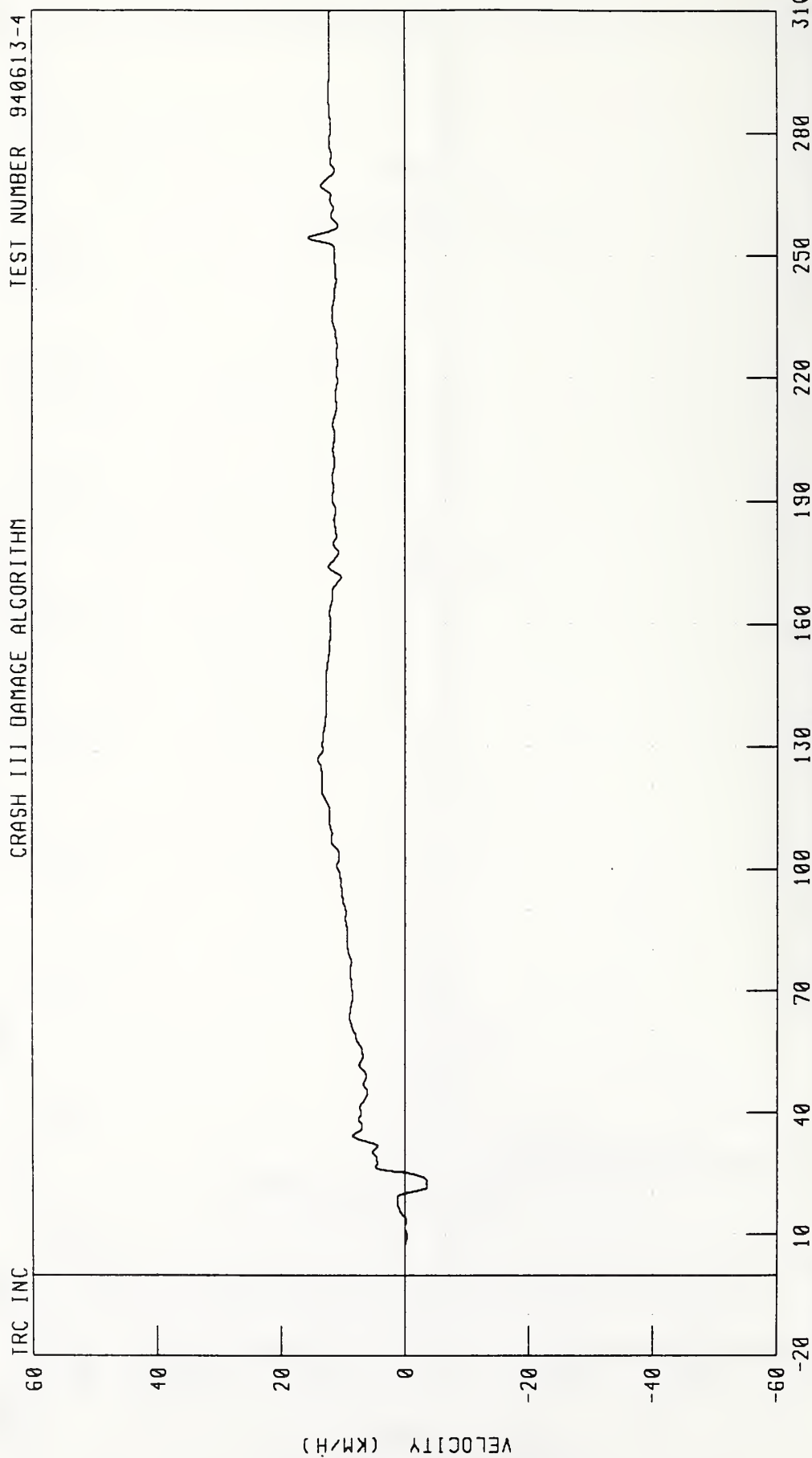
PEAK DATA: 59 34 G @ 25 44 MS, -37 03 G @ 20 40 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



CHANNEL VCGZV1 FILTER CH. CLASS 180

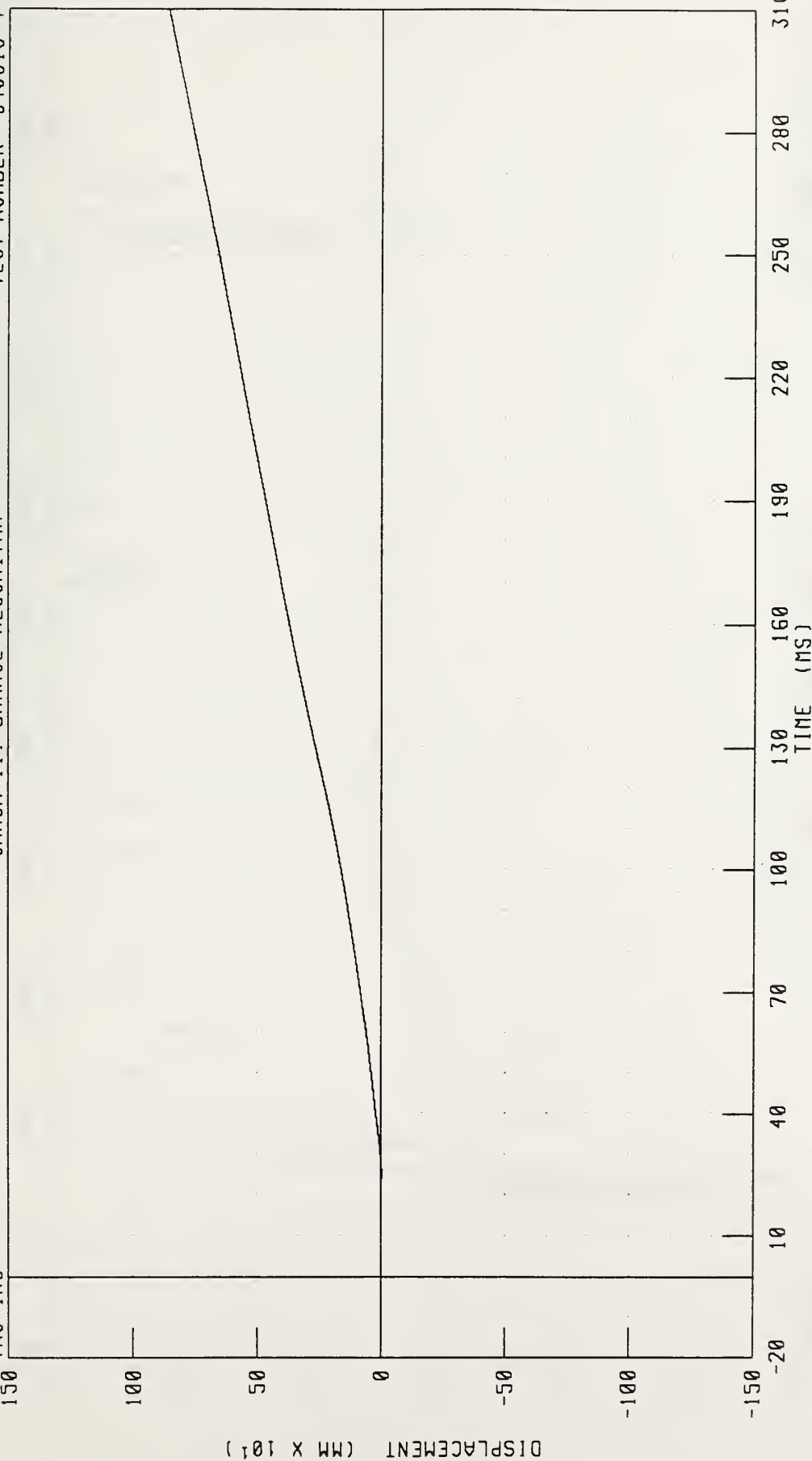
PEAK DATA: 15.59 KM/H @ 254.48 MS, -3.55 KM/H @ 21.84 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CC Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

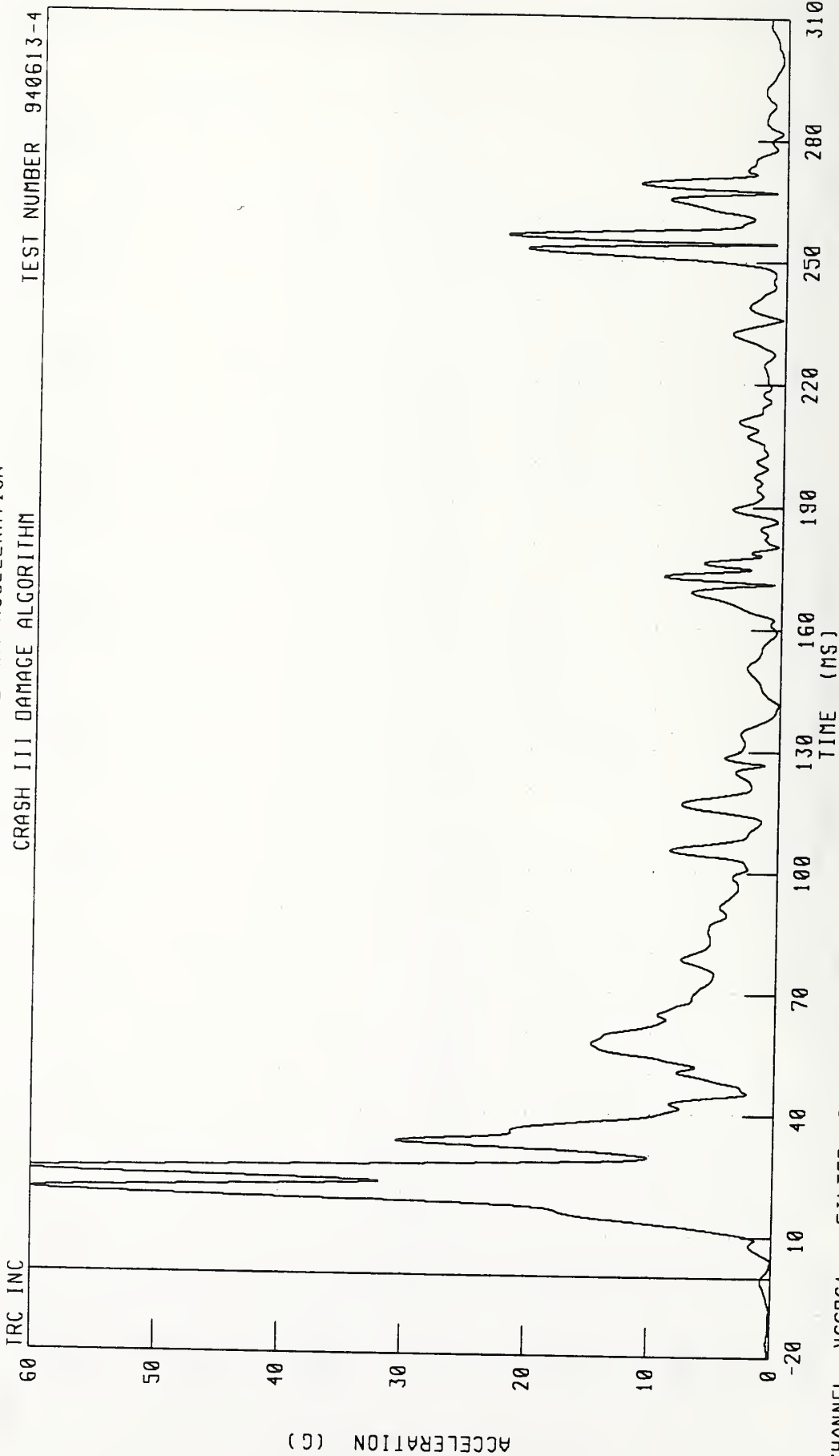
TRC INC



CHANNEL VCGZD1 FILTER: CH CLASS 180

PEAK DATA 858 93 MM @ 310 00 MS, -2 60 MM @ 25 28 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG RESULTANT ACCELERATION



CHANNEL VCGRG1 FILTER CH CLASS 60

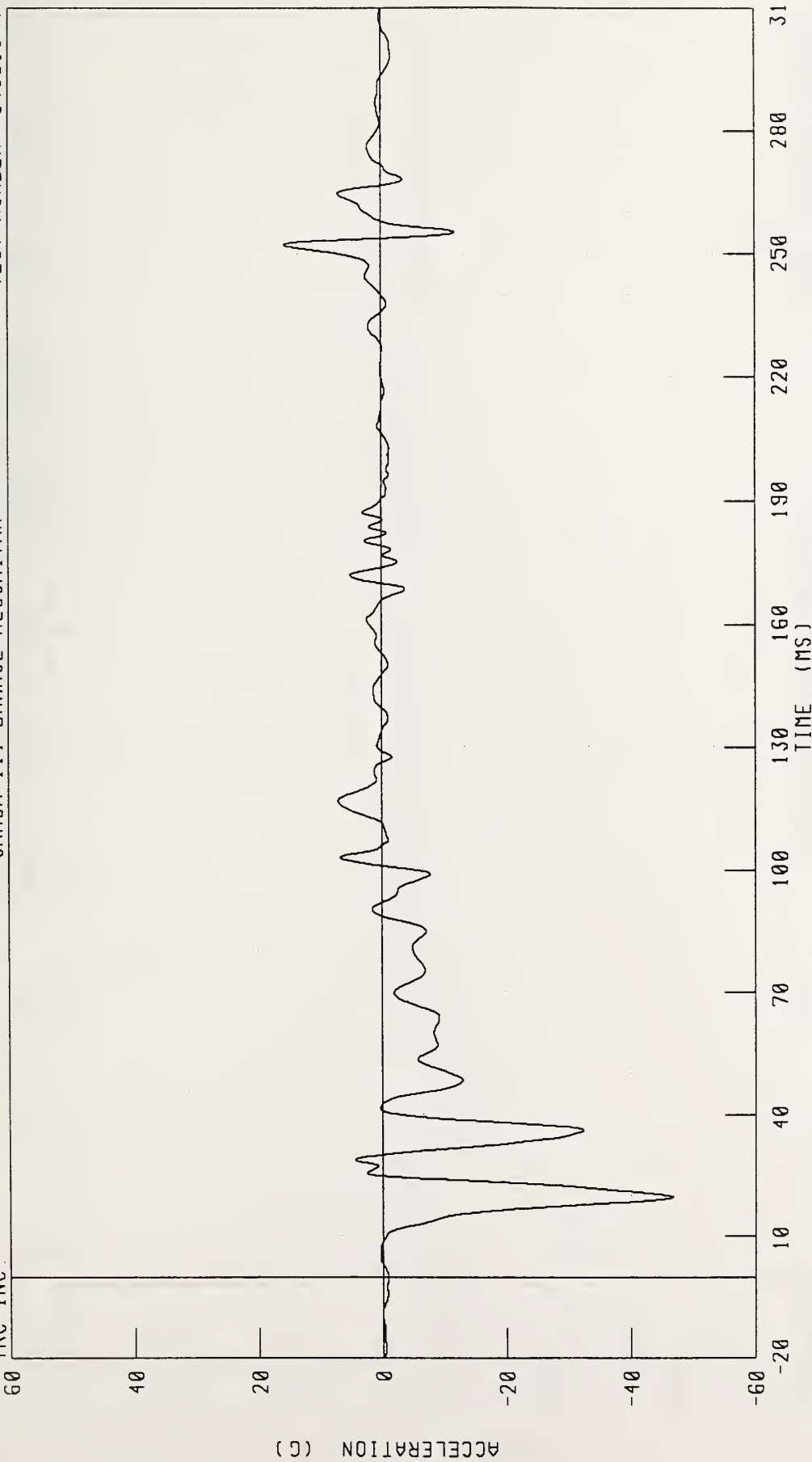
PEAK DATA: 61.48 G @ 25.36 MS; 0.03 G @ 400 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC.



CHANNEL LRSXG1 FILTER CH CLASS 60

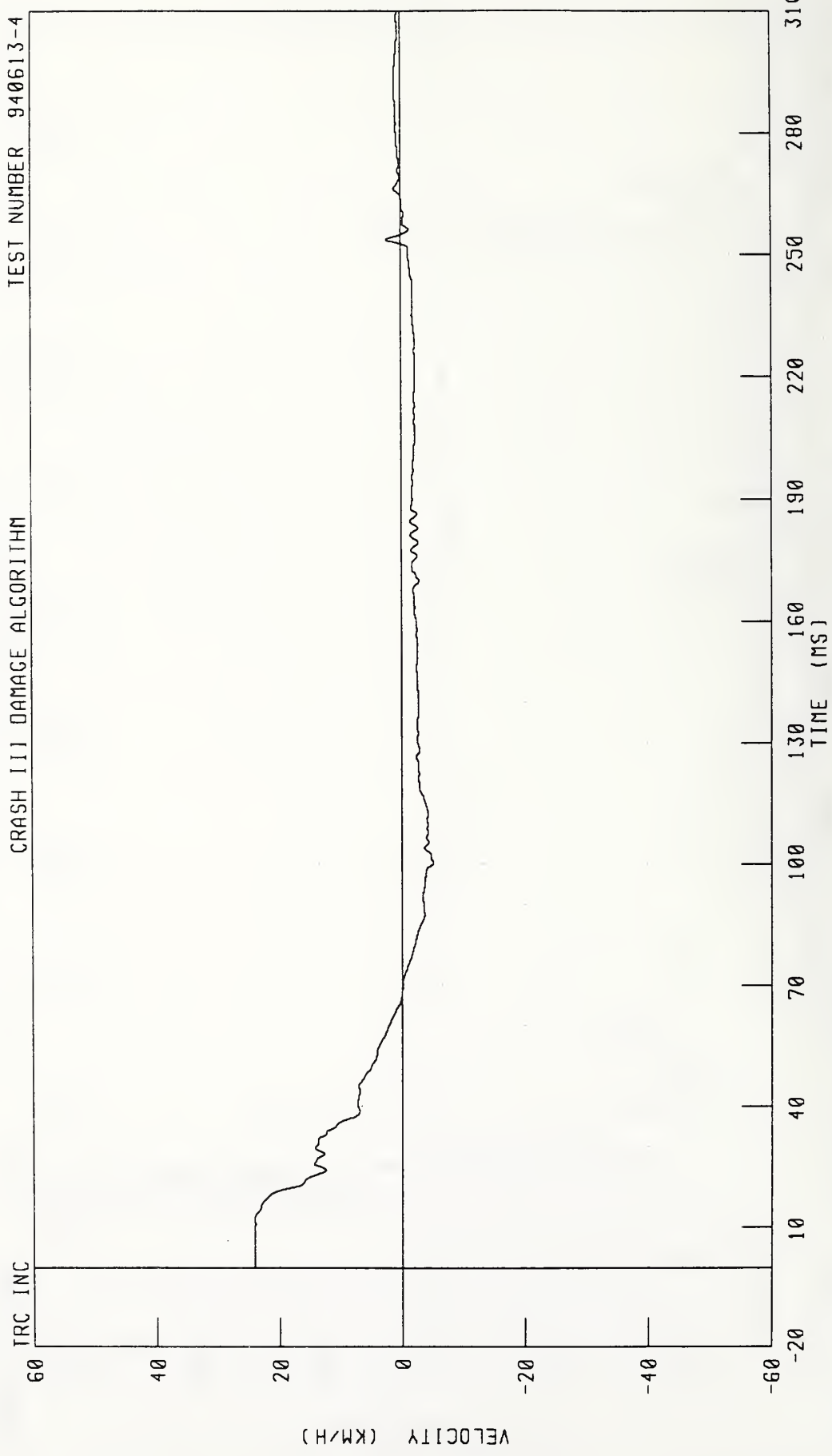
TIME (MS)

PEAK DATA 15 57 G @ 252 32 MS, -46 65 G @ 19 76 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4

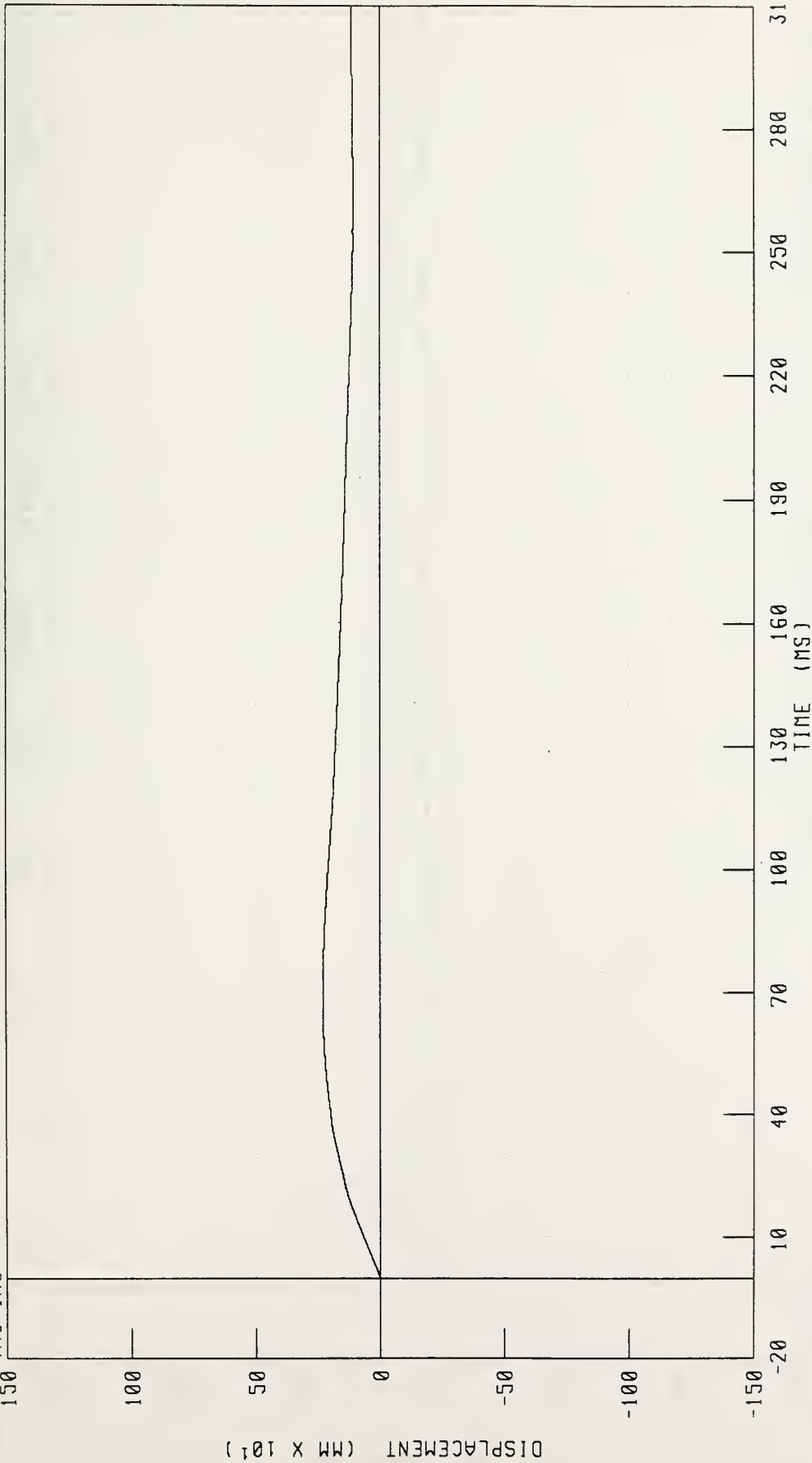


CHANNEL LRSXV1 FILTER CH CLASS 180 PEAK DATA 24 12 KM/H @ 8 64 MS, -5 11 KM/H @ 100 40 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4

TRC INC

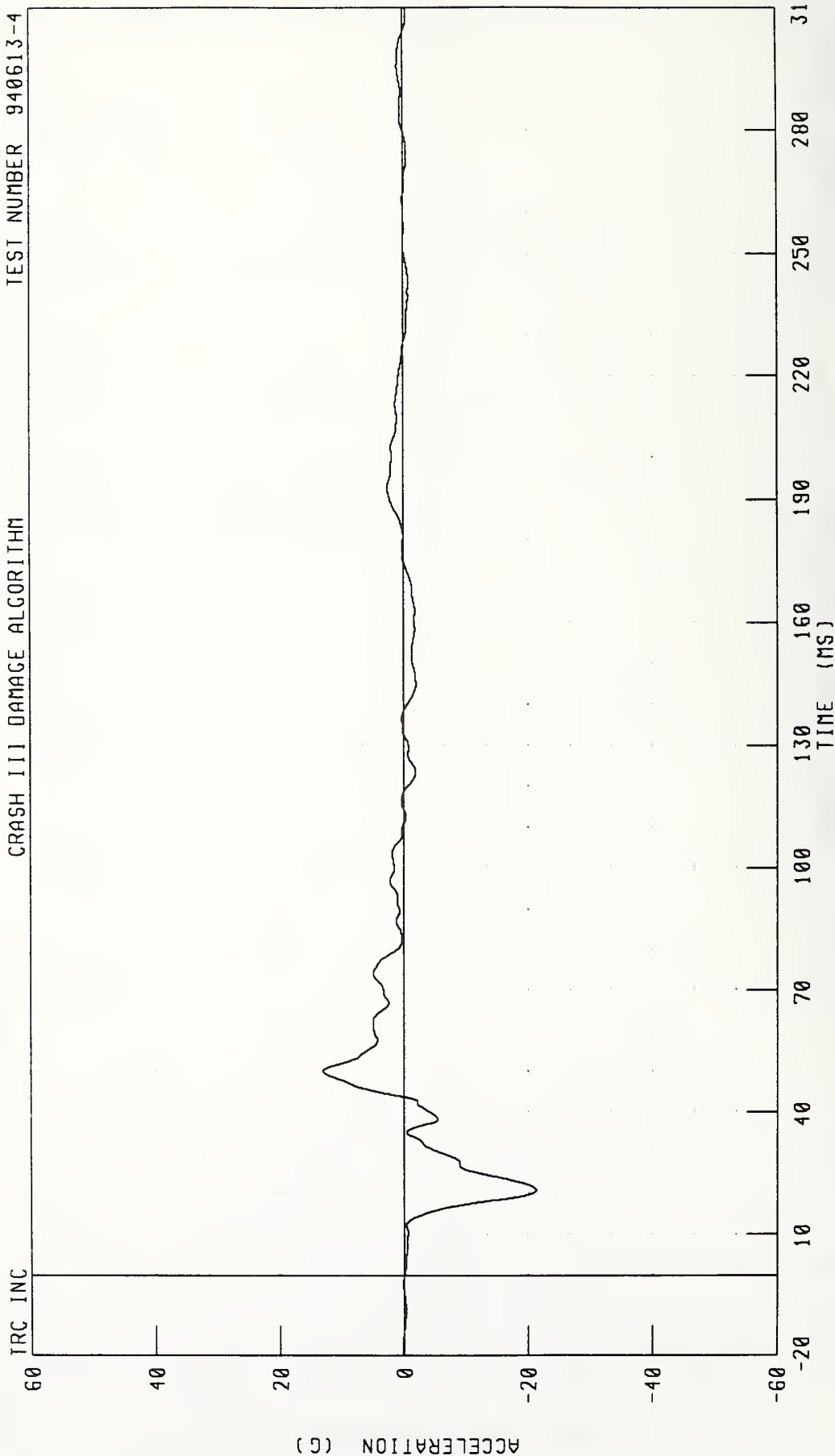


CHANNEL LRSXD1 FILTER CH CLASS 180

PEAK DATA 229 75 MM @ 68 08 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4



CHANNEL: LRSYG1 FILTER: CH CLASS 60

PEAK DATA: 13 03 G @ 50 16 MS, -21 26 G @ 20 80 MS

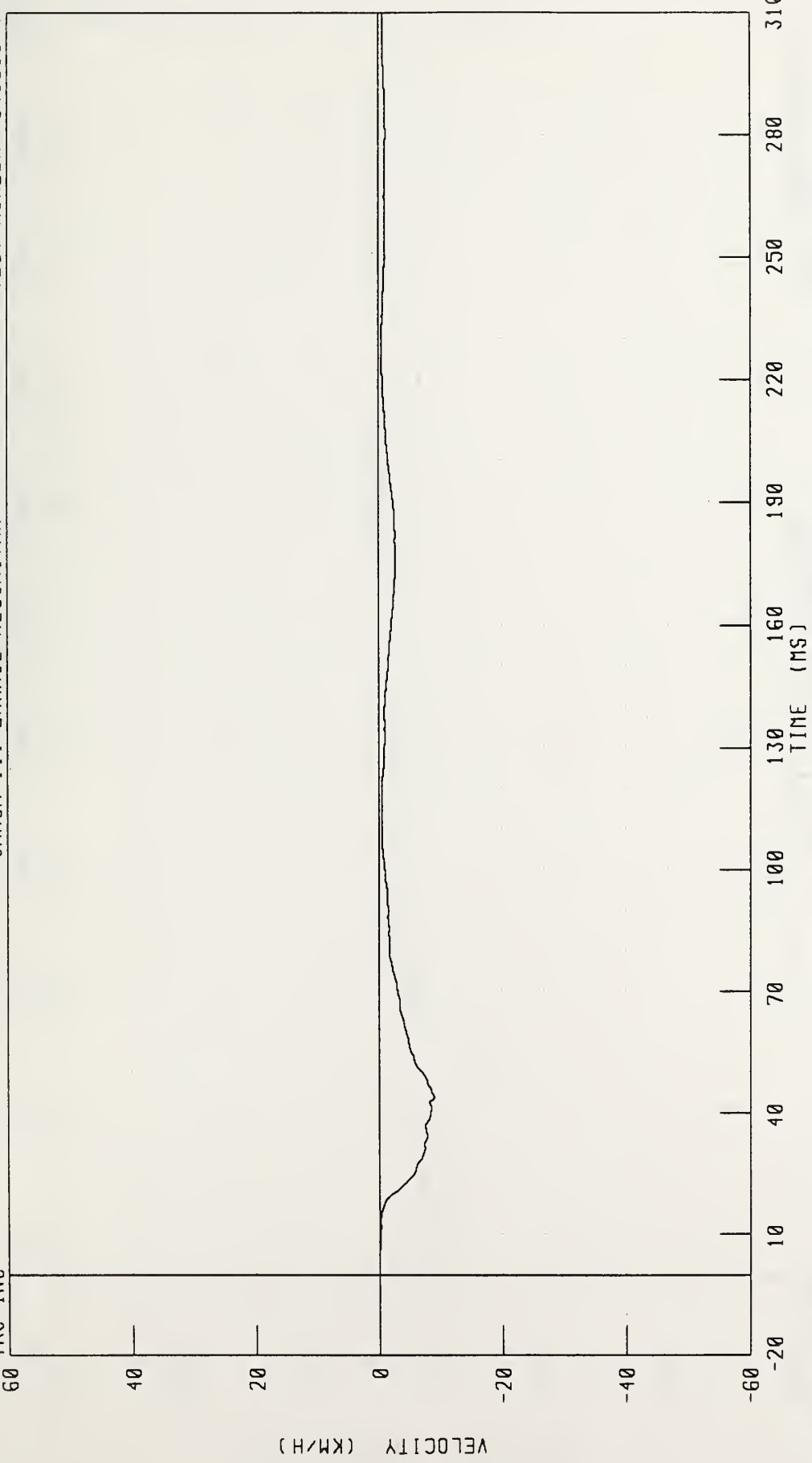
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC

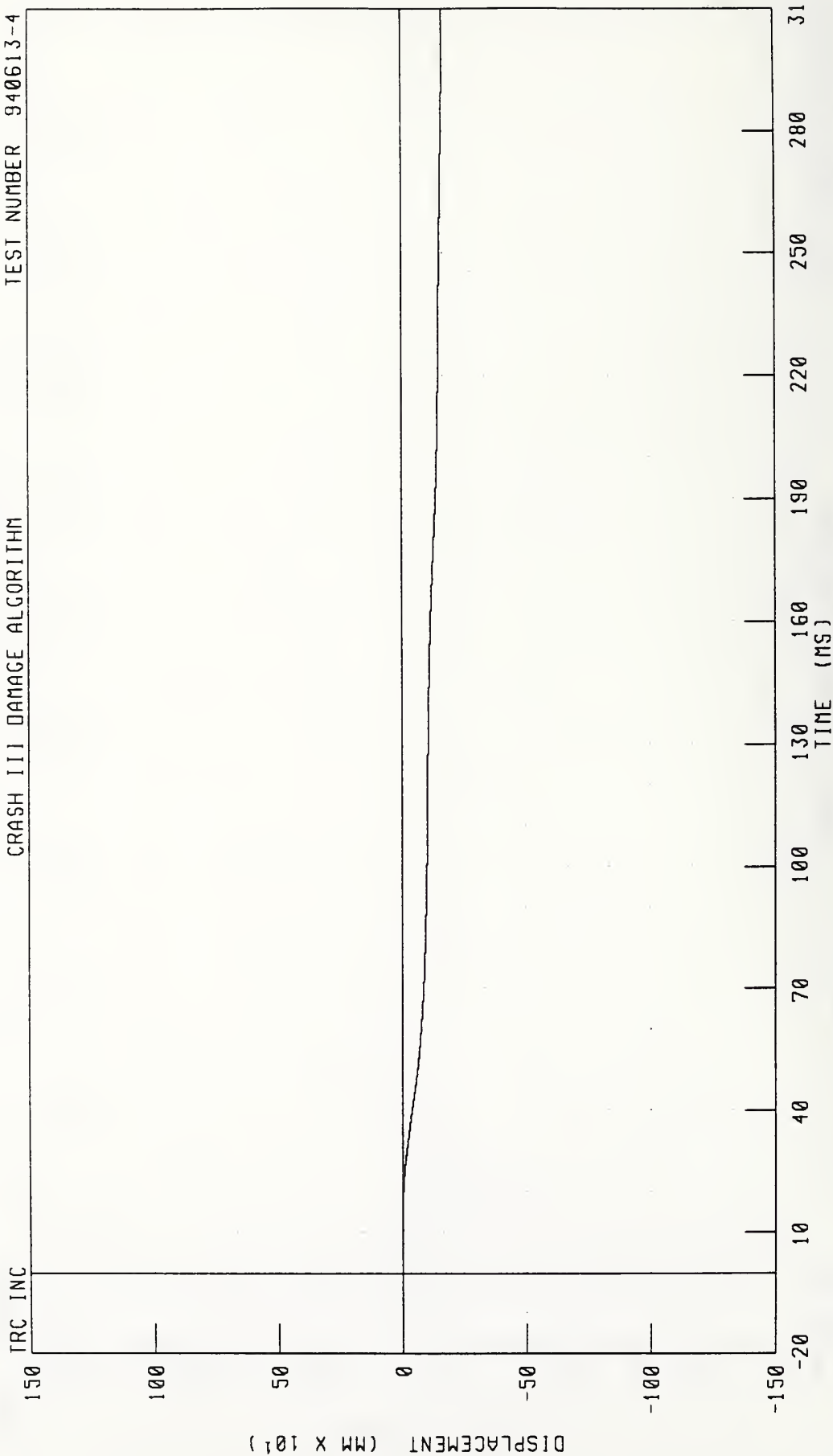


CHANNEL LRSYV1 FILTER CH CLASS 180

PEAK DATA: 0 00 KM/H @ 0 00 MS, -8.92 KM/H @ 43.92 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4



CHANNEL LRSYD1 FILTER: CH CLASS 180

PEAK DATA: 0 00 MM @ 0 00 MS; -166.98 MM @ 310 00 MS

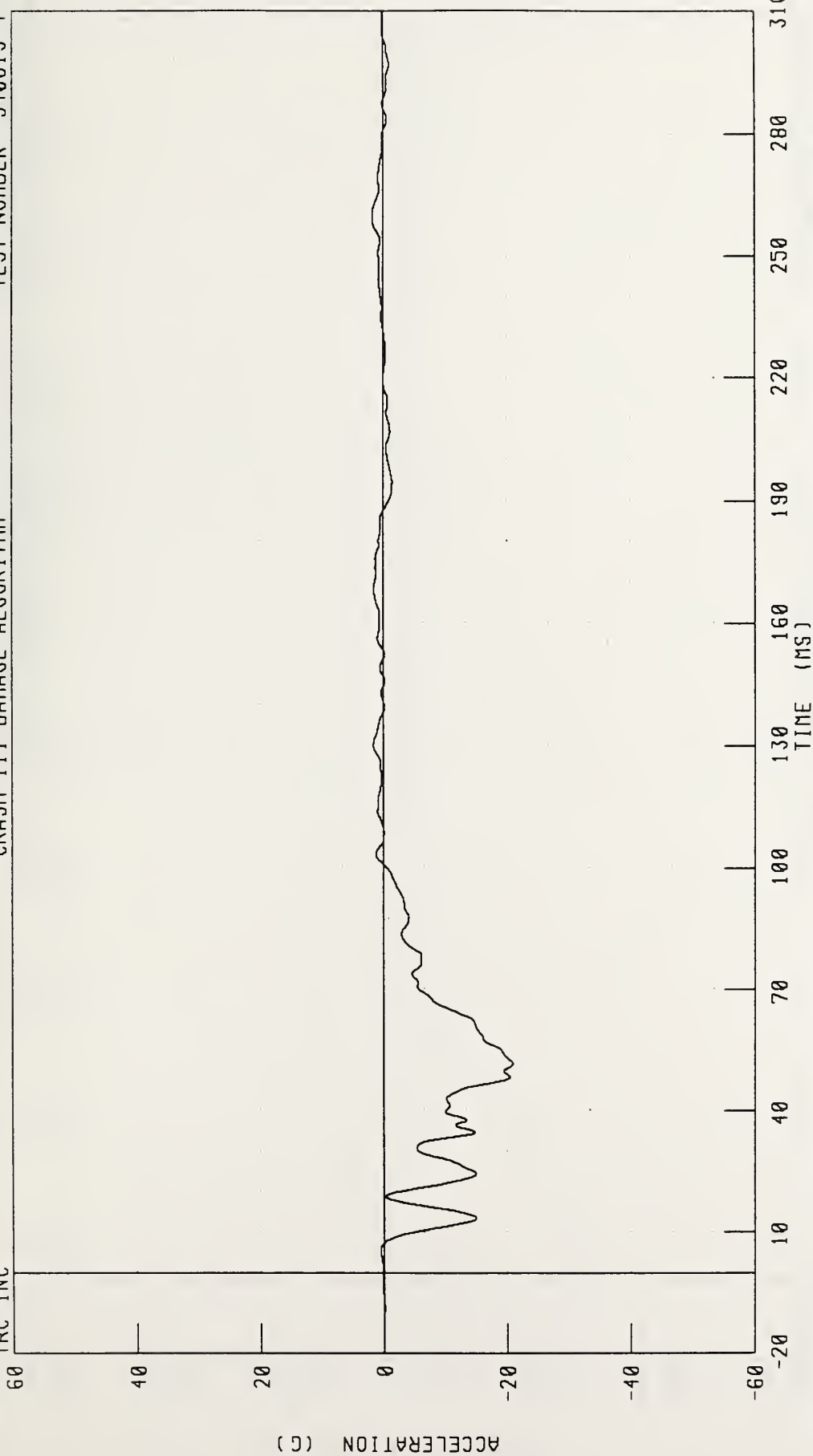
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC



CHANNEL RRSXG1 FILTER CH CLASS 60

PEAK DATA: 1.78 G @ 260 32 MS, -20 91 G @ 51 60 MS

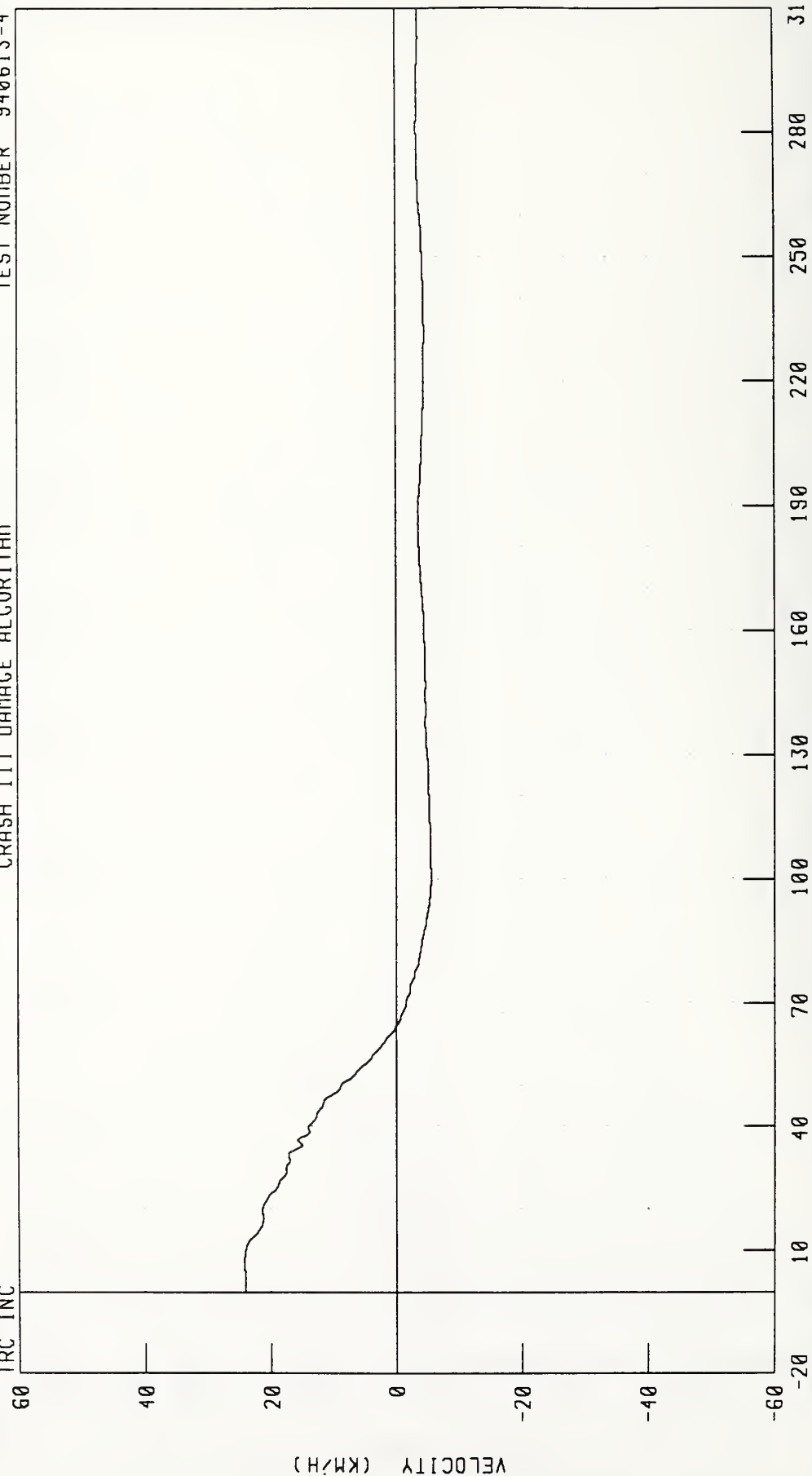
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS VELOCITY

TEST NUMBER 940613-4

CRASH III DAMAGE ALGORITHM

TRC INC



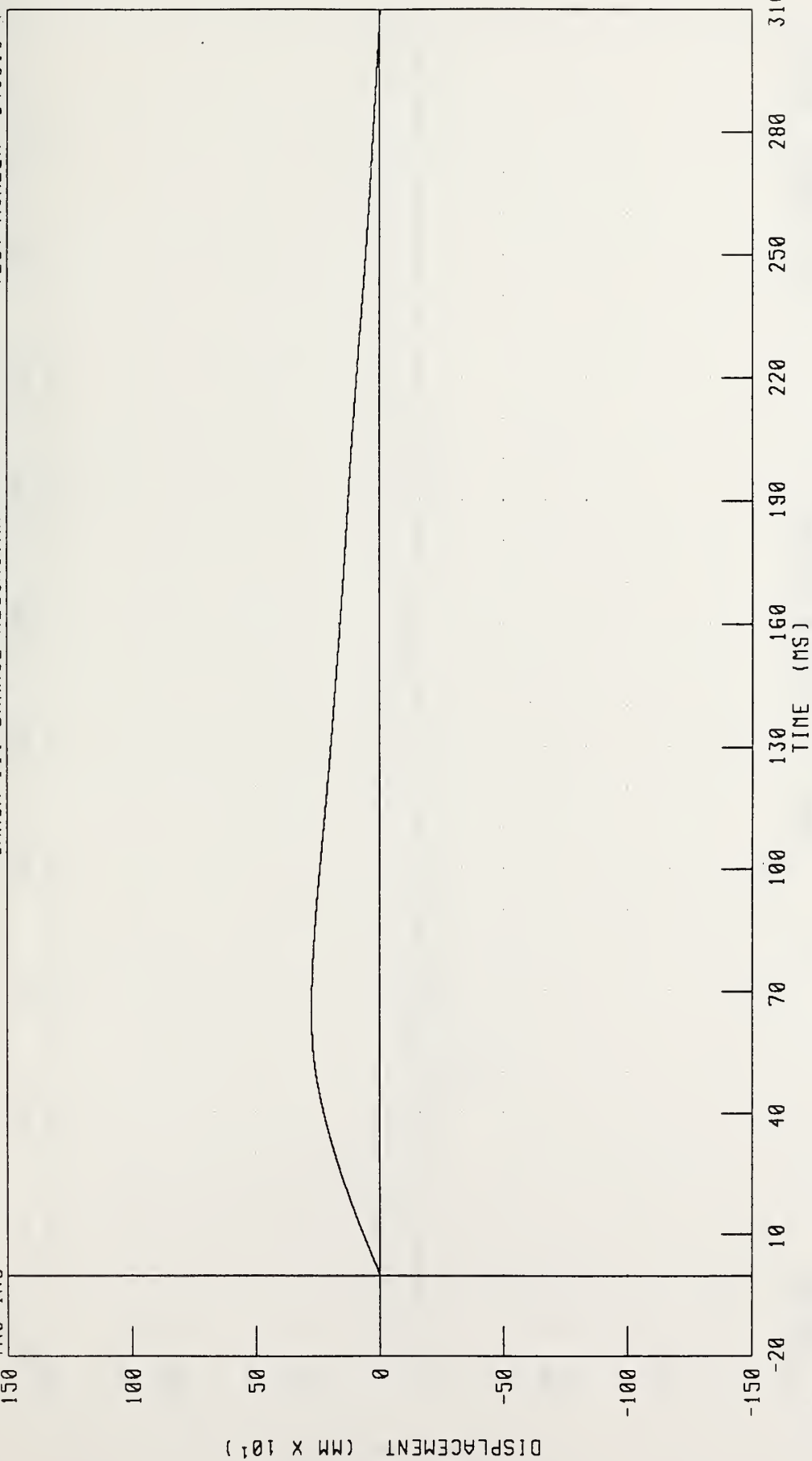
CHANNEL RRSXV1 FILTER: CH CLASS 180

PEAK DATA 24 17 KM/H @ 6 88 MS, -5 59 KM/H @ 101 52 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-4

TRC INC



CHANNEL RRSXD1 FILTER CH CLASS 180

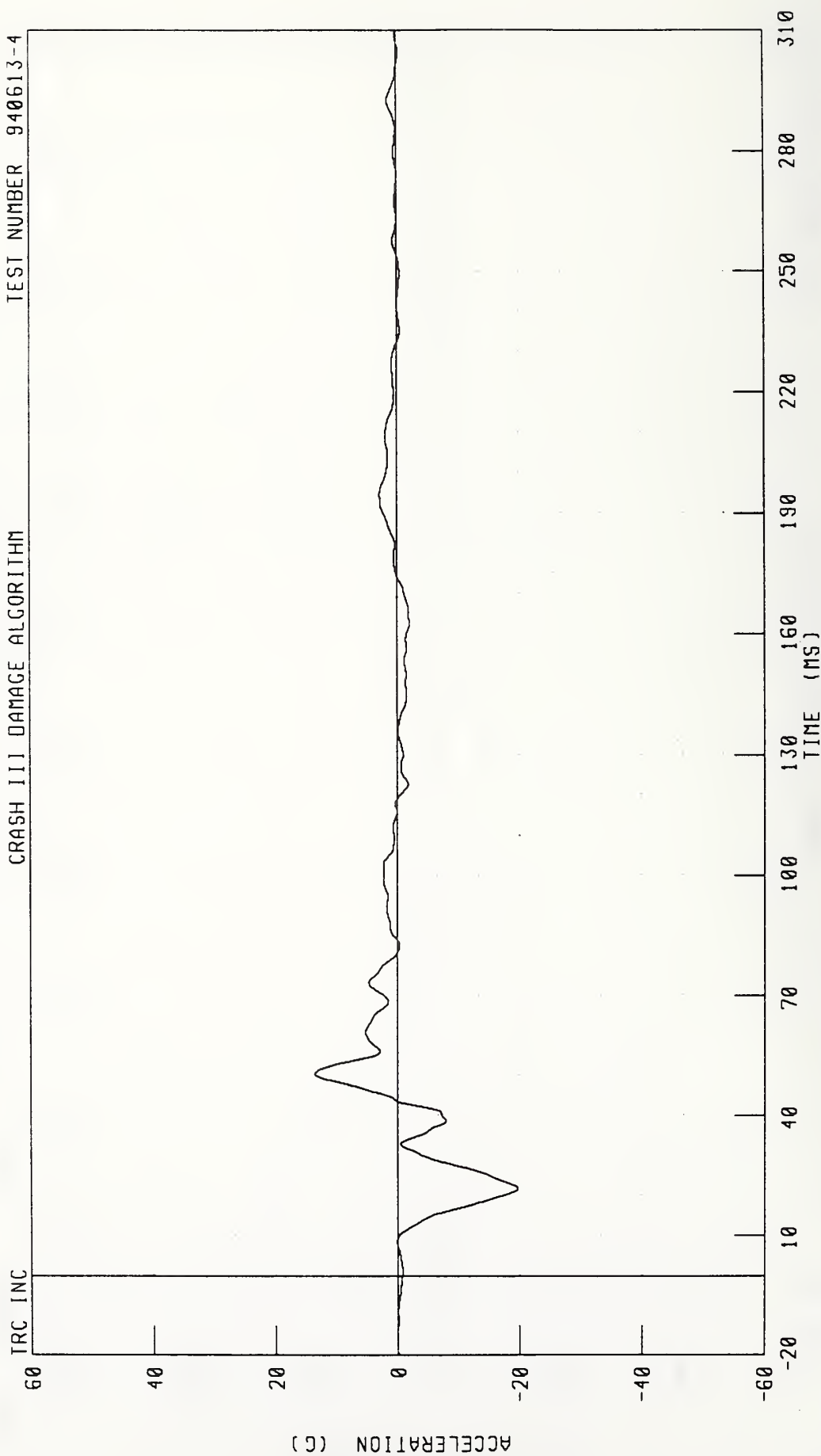
PEAK DATA 275 24 MM @ 64 80 MS, -3.17 MM @ 310 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



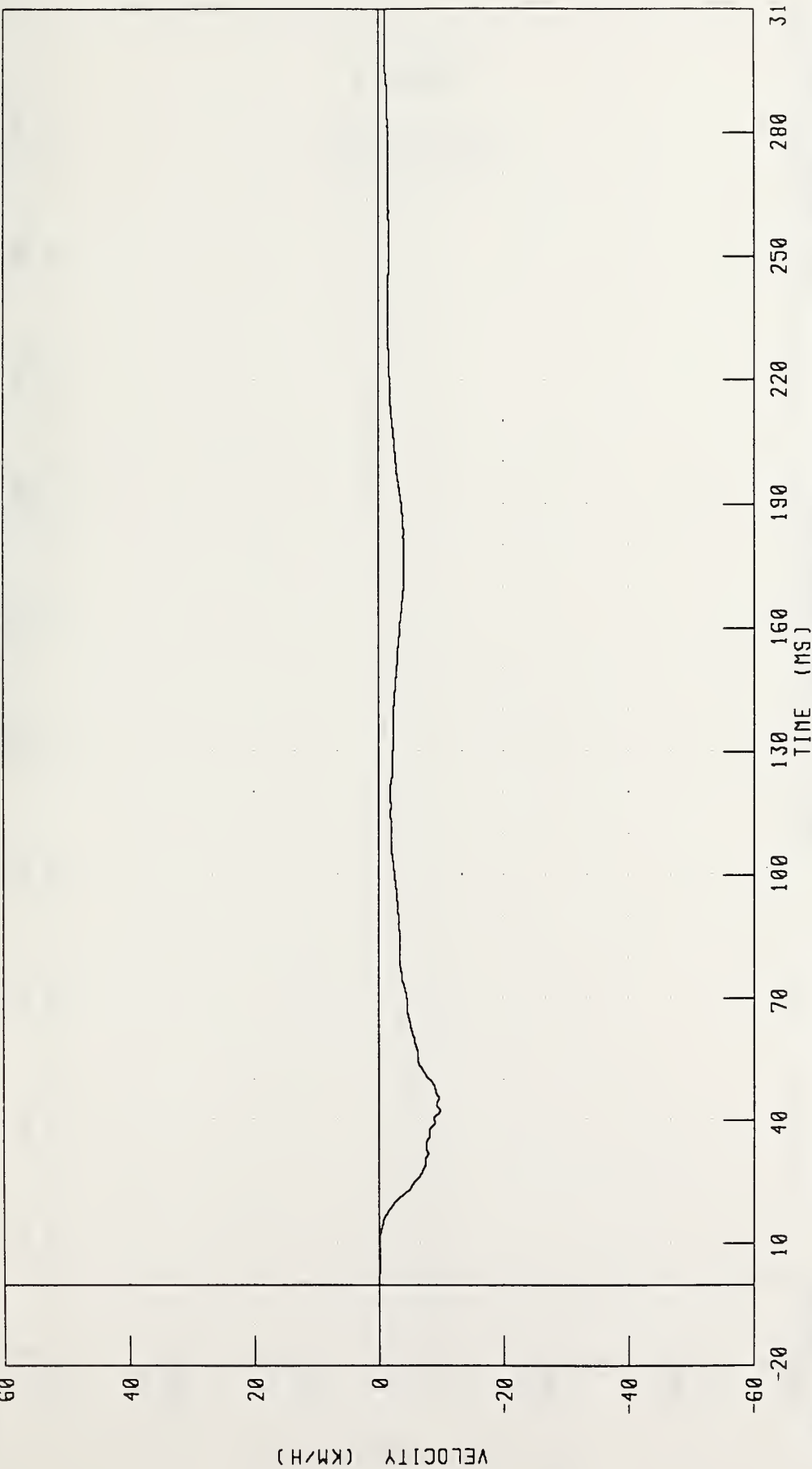
CHANNEL RRSYG1 FILTER CH CLASS 60

PEAK DATA: 13 55 G @ 50.40 MS; -19 61 G @ 21 84 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL Y-AXIS VELOCITY  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4

TRC INC



CHANNEL RRSYV1 FILTER: CH. CLASS 180

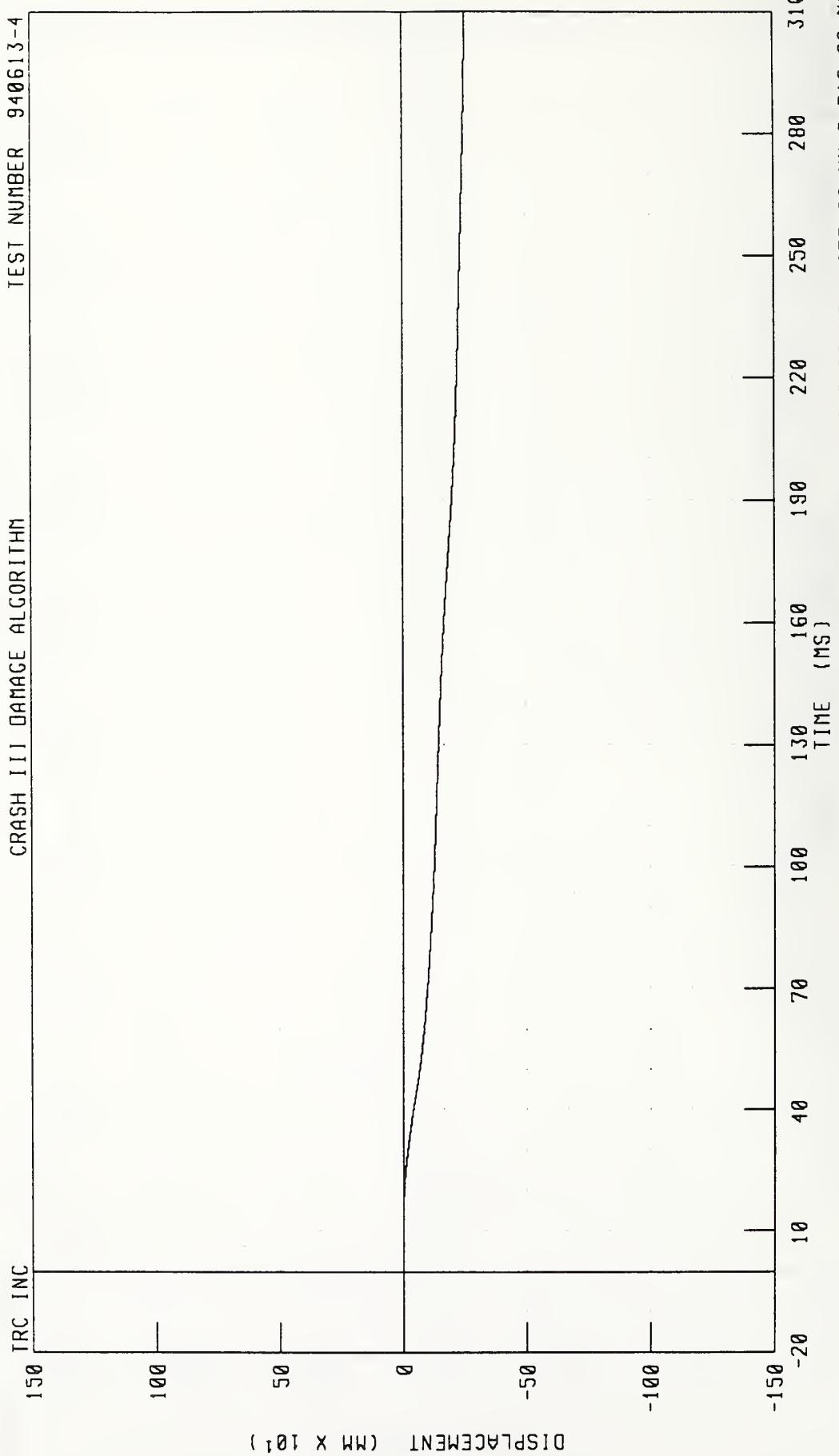
PEAK DATA: 0 00 KM/H @ 0 00 MS, -9 84 KM/H @ 42 32 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-4



CHANNEL RRSYD1 FILTER CH CLASS 180

PEAK DATA 0 00 MM @ 0 00 MS; -255 06 MM @ 310 00 MS

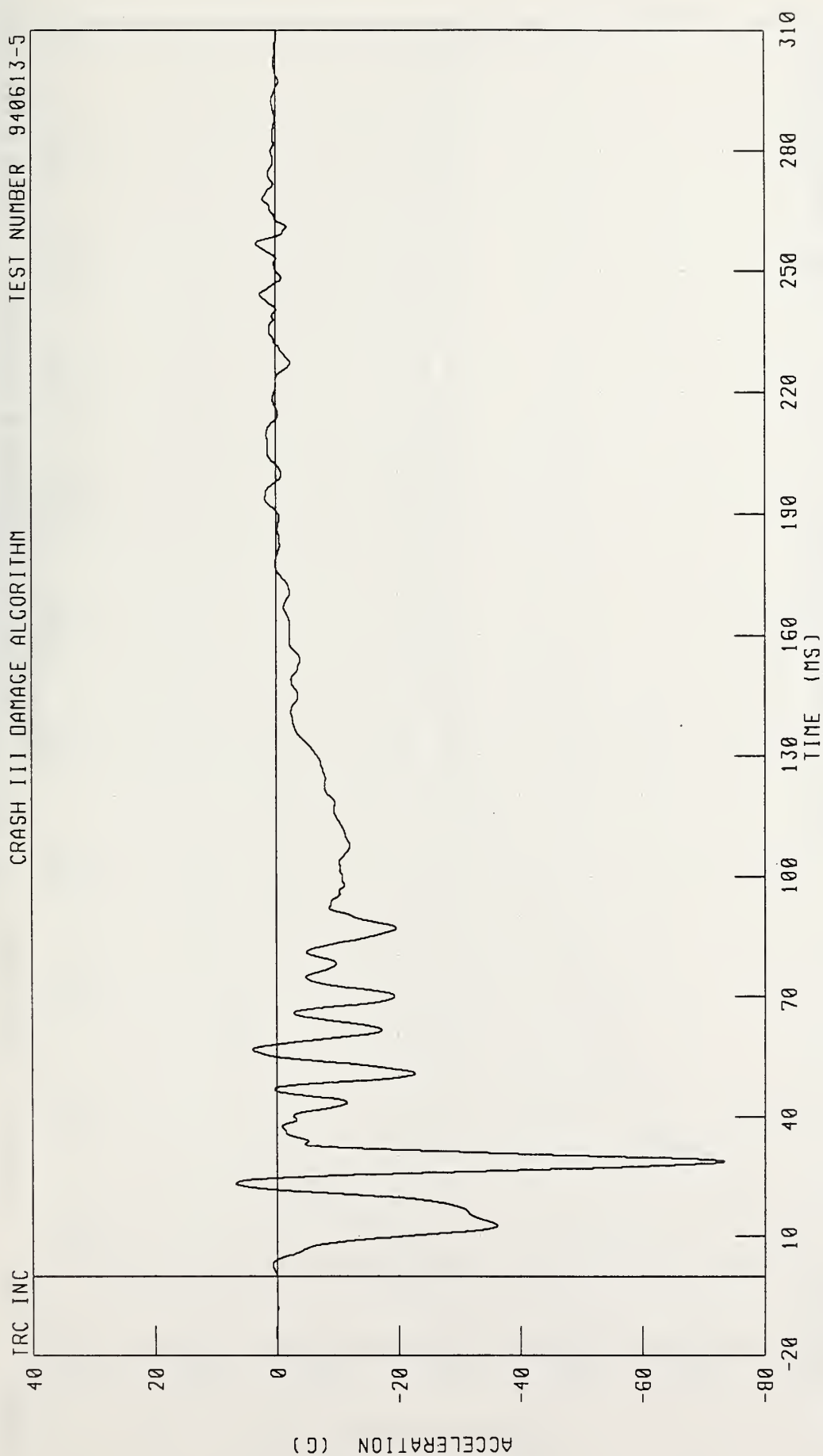
Data Plots

Test No. 940613-5



1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5



CHANNEL VCGXG1 FILTER CH CLASS 60

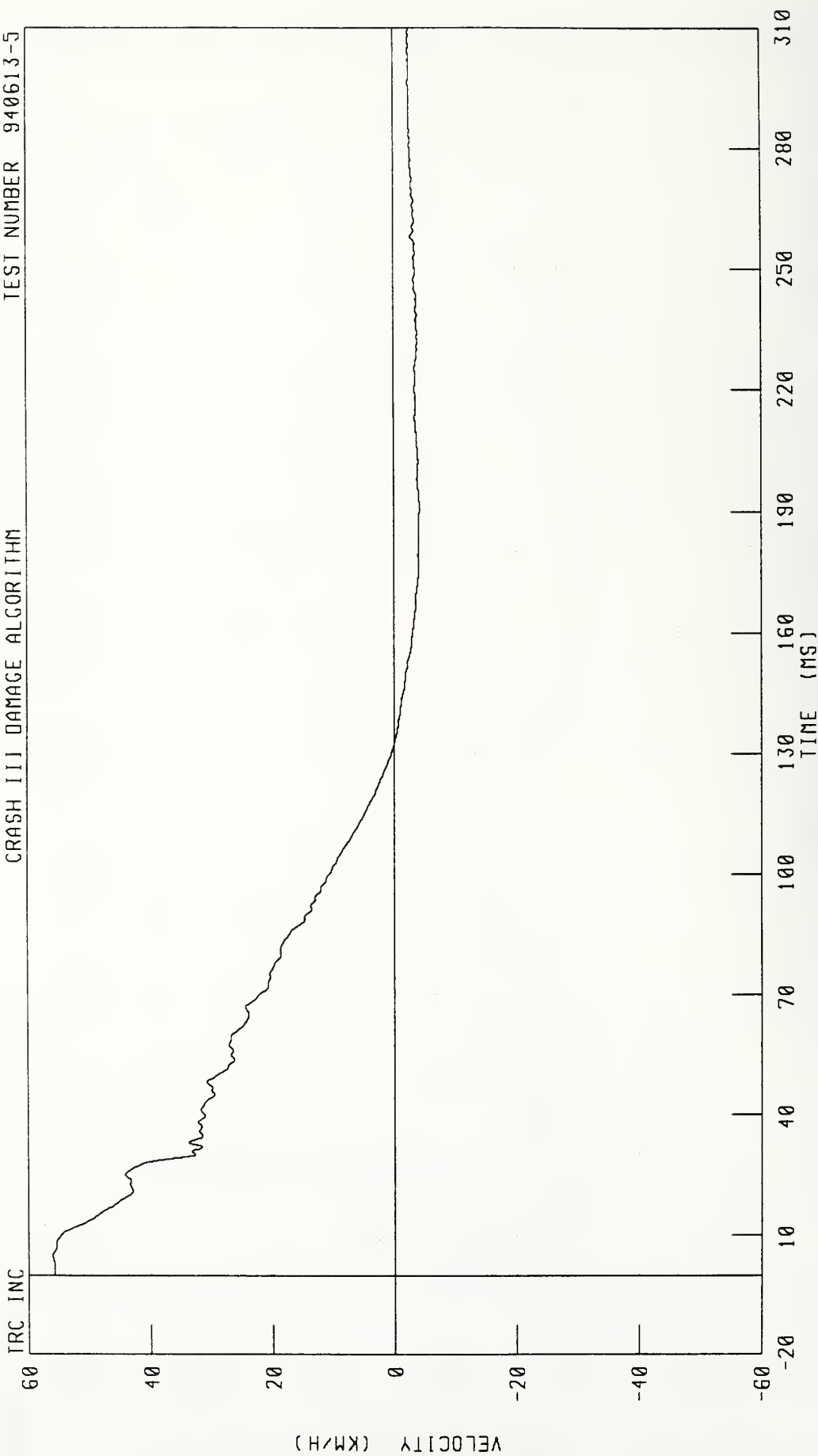
PEAK DATA 6 74 G @ 23 20 MS, -73 30 G @ 28 88 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

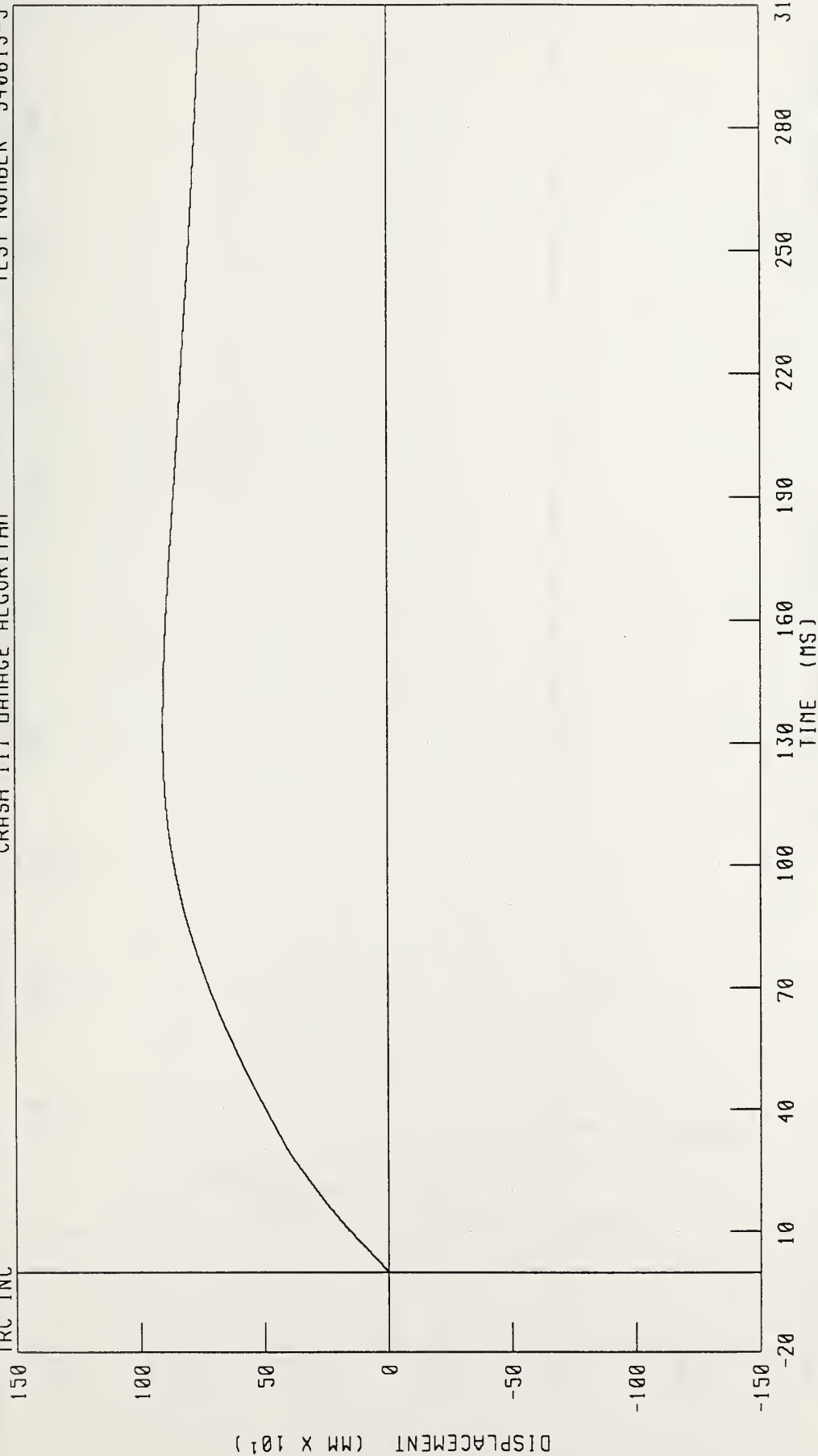


1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC



CHANNEL VCGXD1 FILTER CH CLASS 180

PEAK DATA 904 75 MM @ 132 40 MS, 0 00 MM @ 0 00 MS

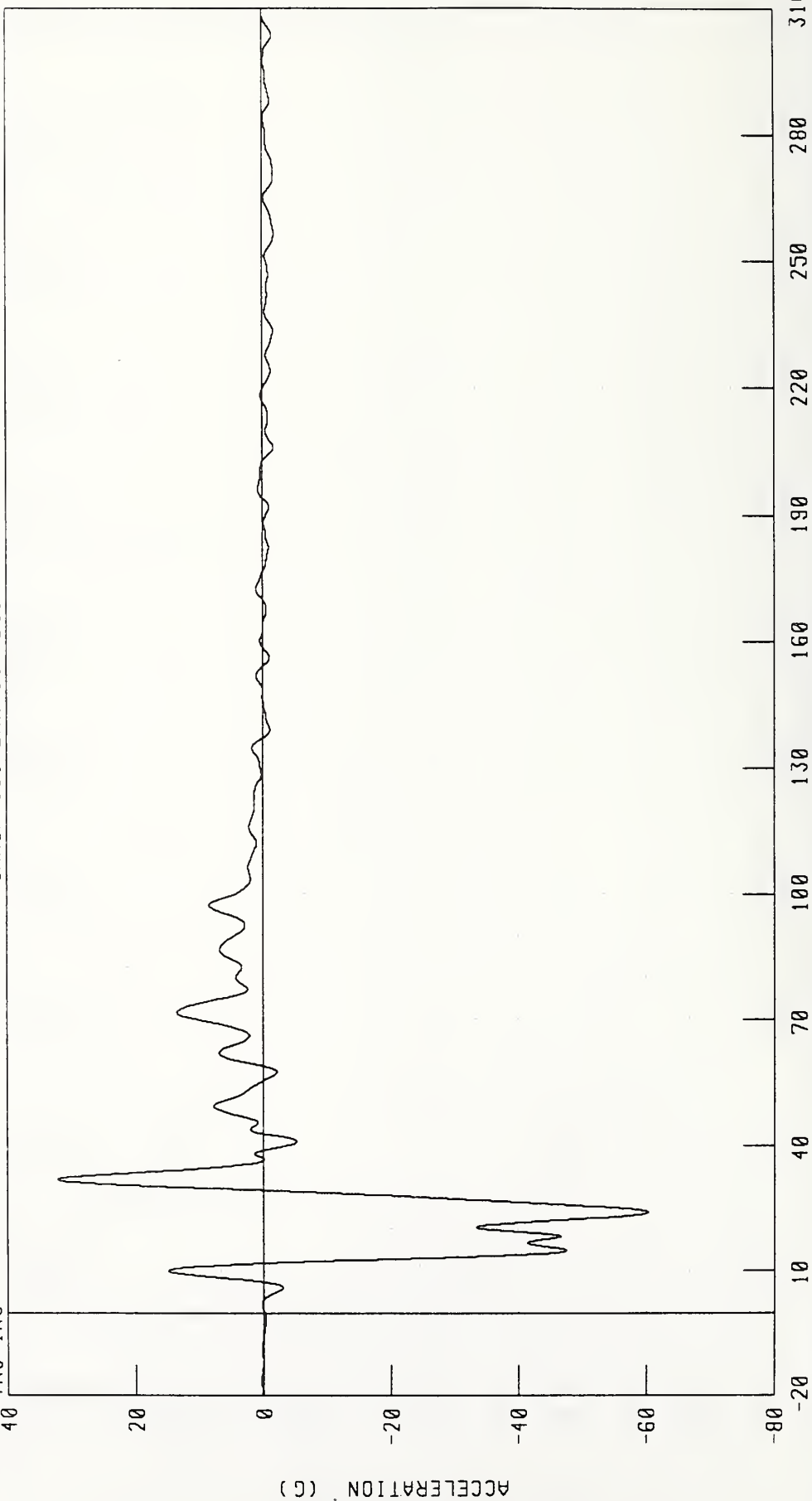
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC



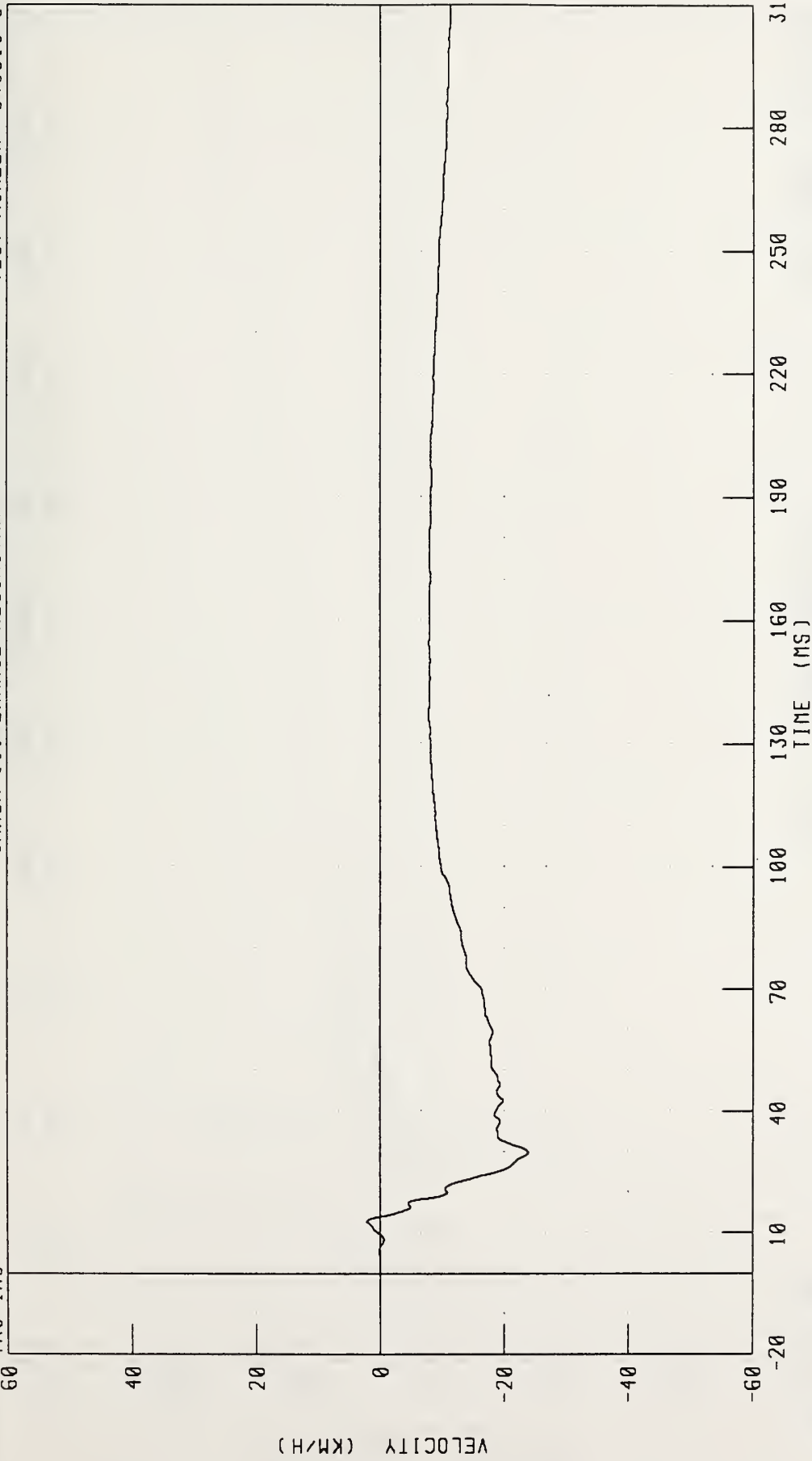
CHANNEL VCGY1 FILTER CH CLASS 60

PEAK DATA: 32 09 G @ 32 00 MS, -60.38 G @ 24 16 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CC Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5

TRC INC



CHANNEL VCGYV1 FILTER CH CLASS 180

PEAK DATA 2.15 KM/H @ 12.88 MS, -23.82 KM/H @ 29.84 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

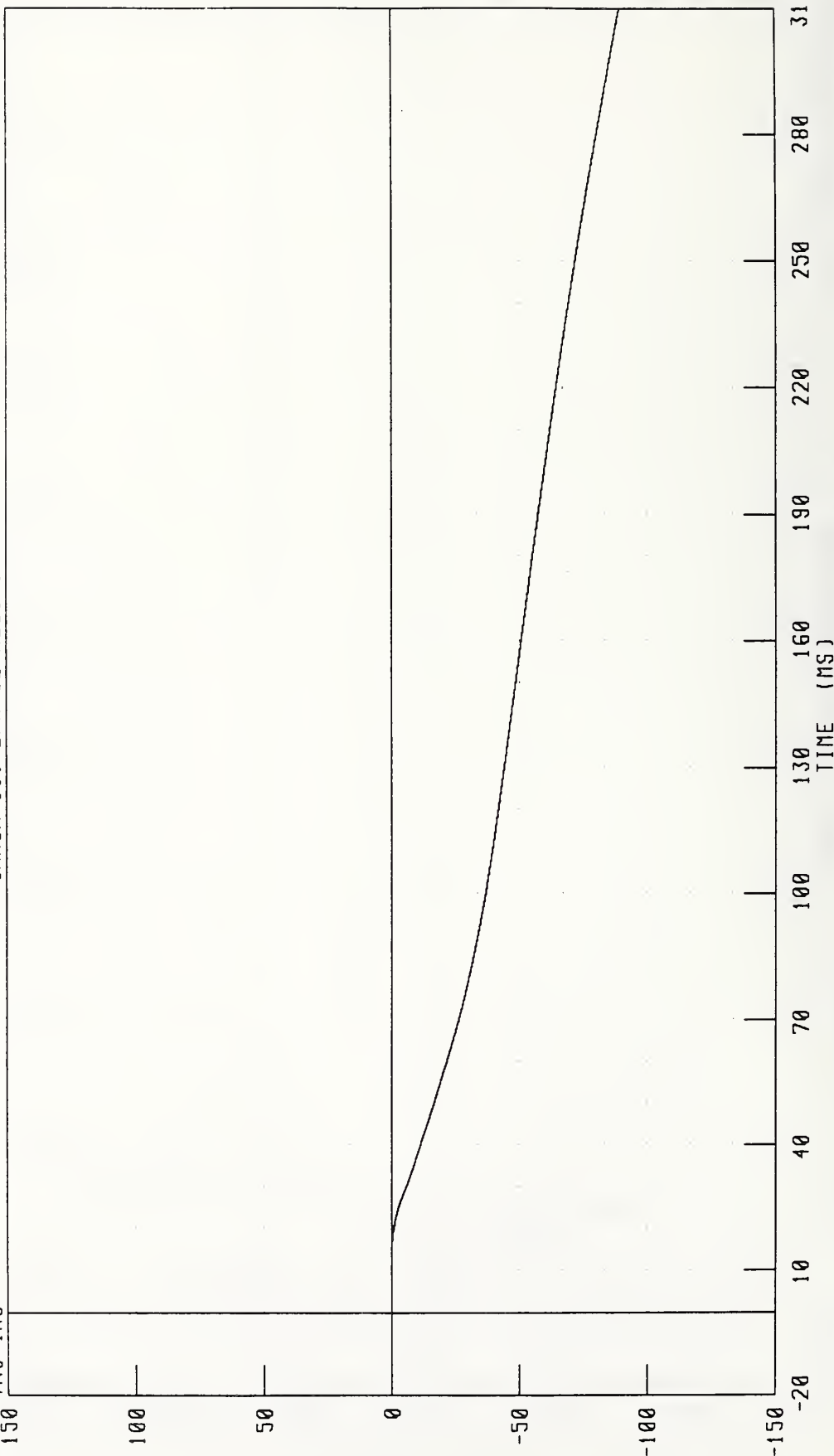
VEHICLE CC Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC

DISPLACEMENT (MM X 10<sup>1</sup>)

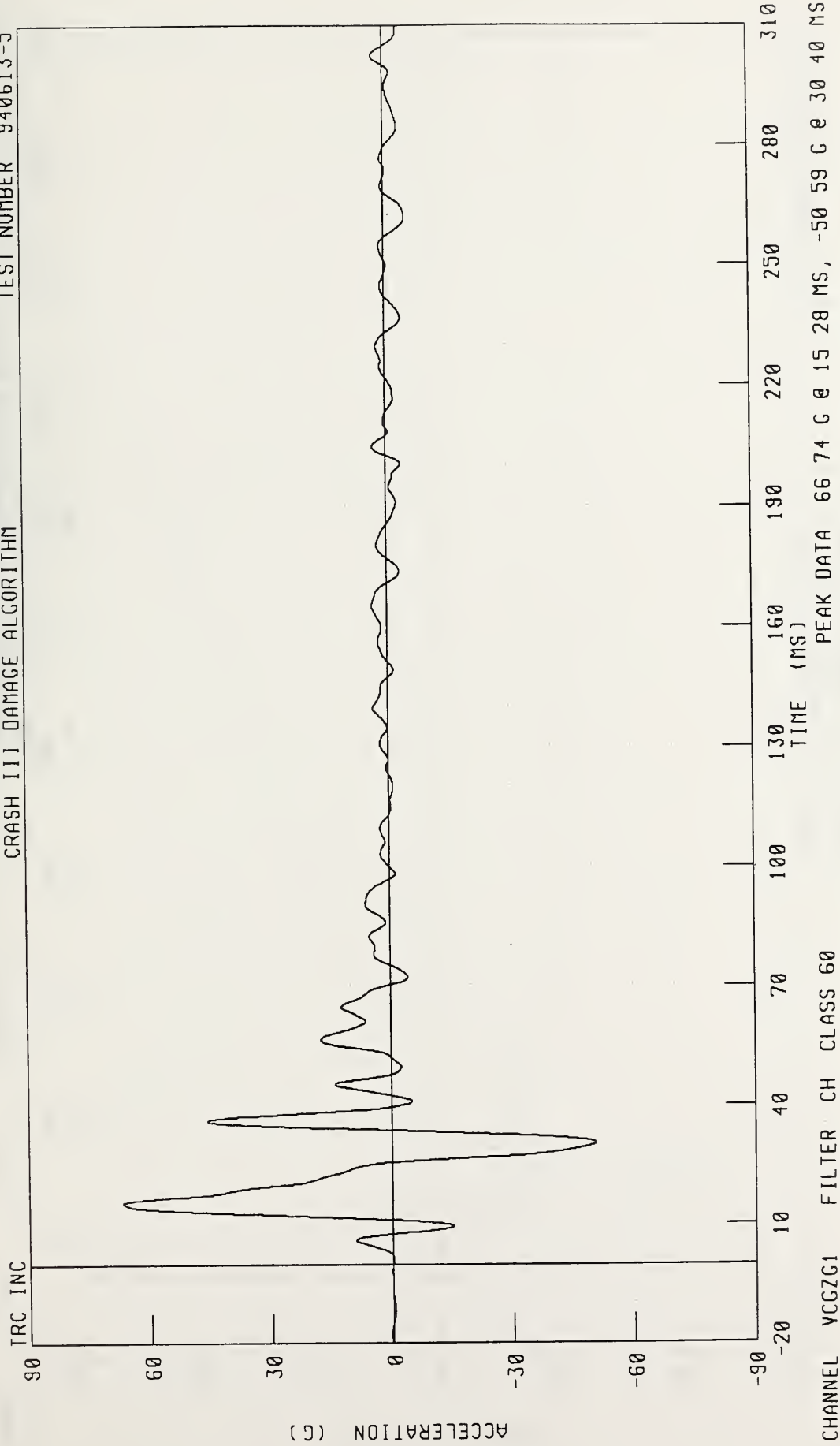


CHANNEL VCCYD1 FILTER CH. CLASS 180

PEAK DATA: 1.20 MM @ 13.92 MS, -893.43 MM @ 310.00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CC Z-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



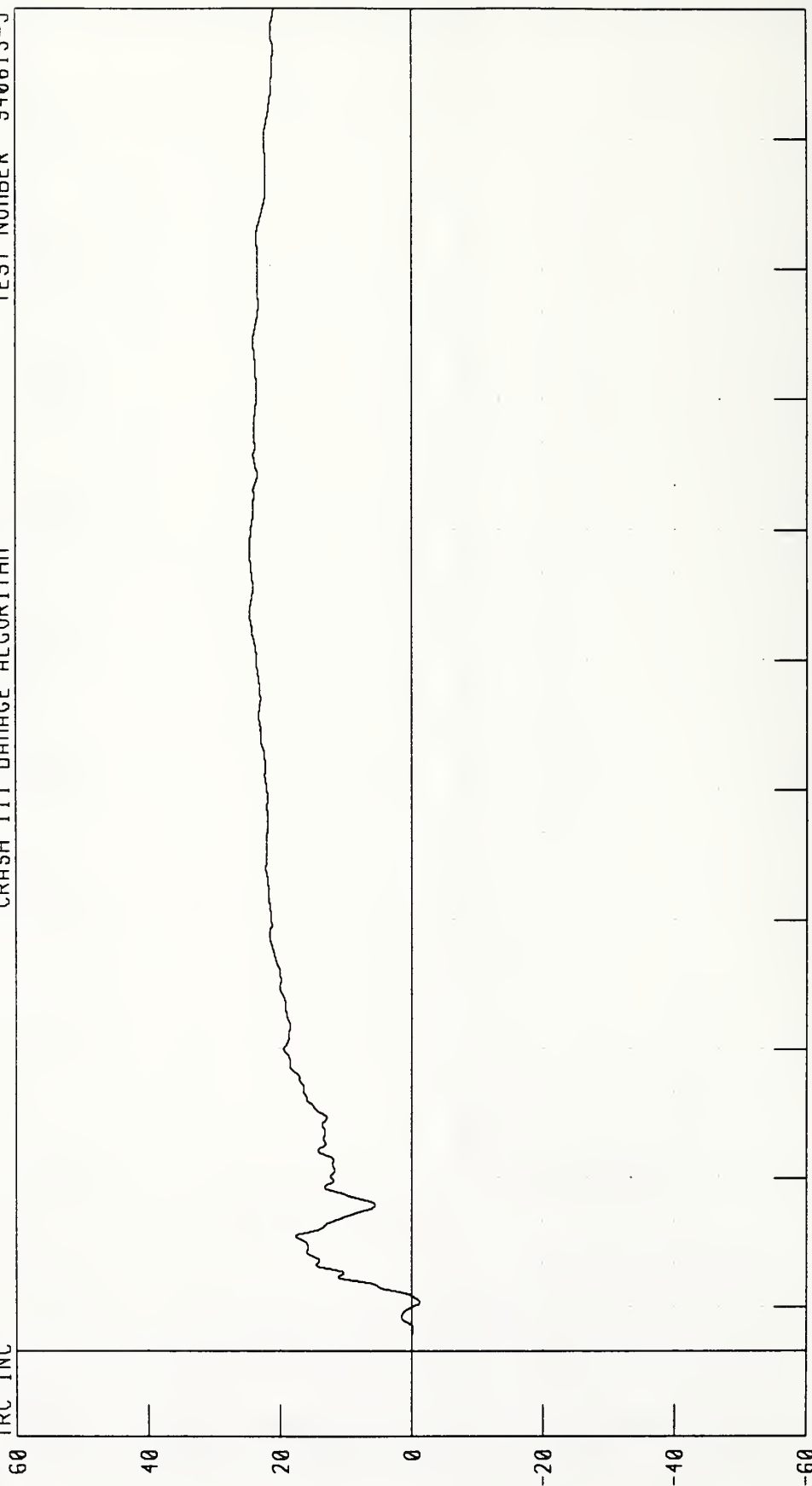
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CC 7-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC



CHANNEL VCGZV1 FILTER CH CLASS 180

TIME (MS)

PEAK DATA: 24.61 KM/H @ 185.92 MS, -1.26 KM/H @ 11.12 MS

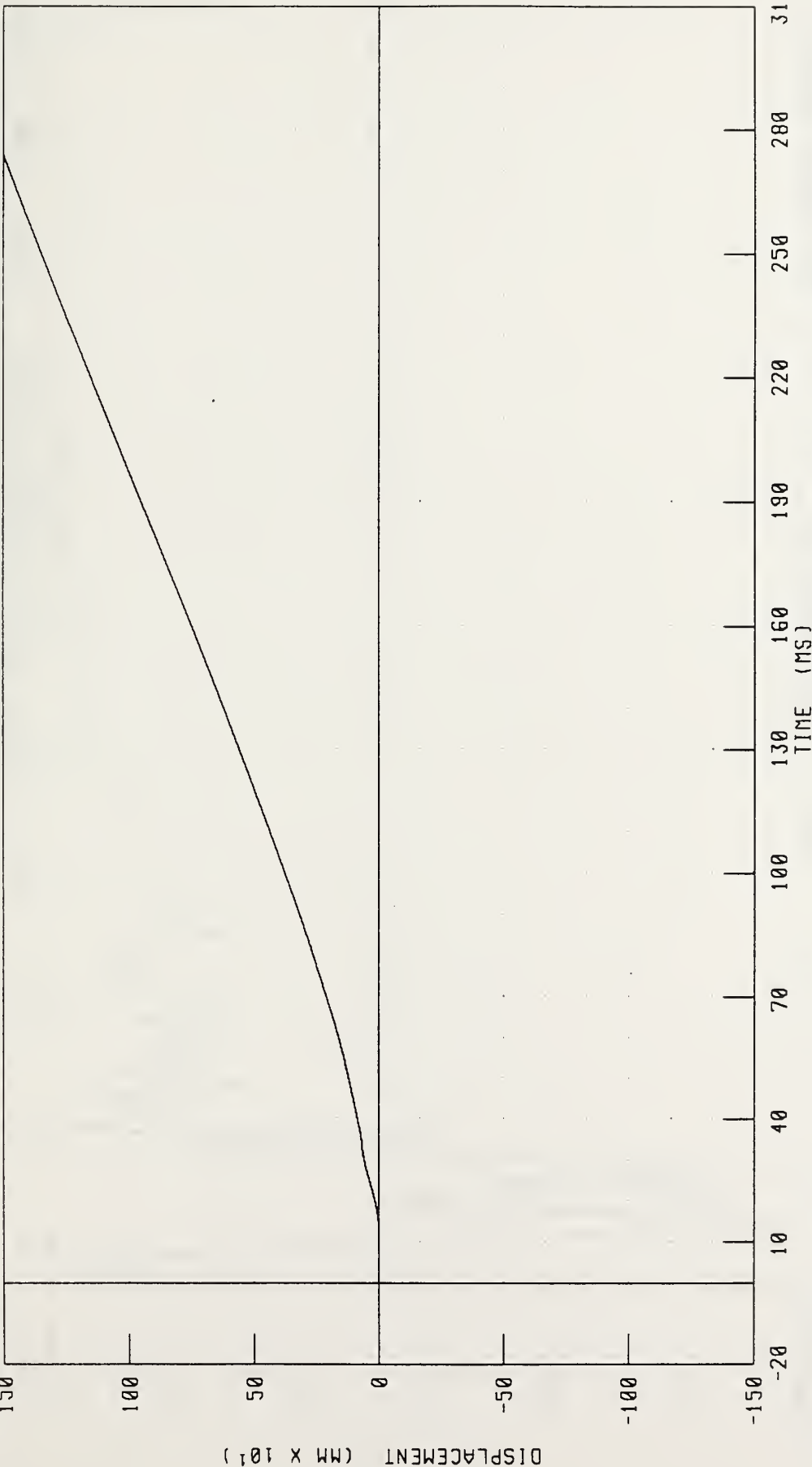
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

VEHICLE CG Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC

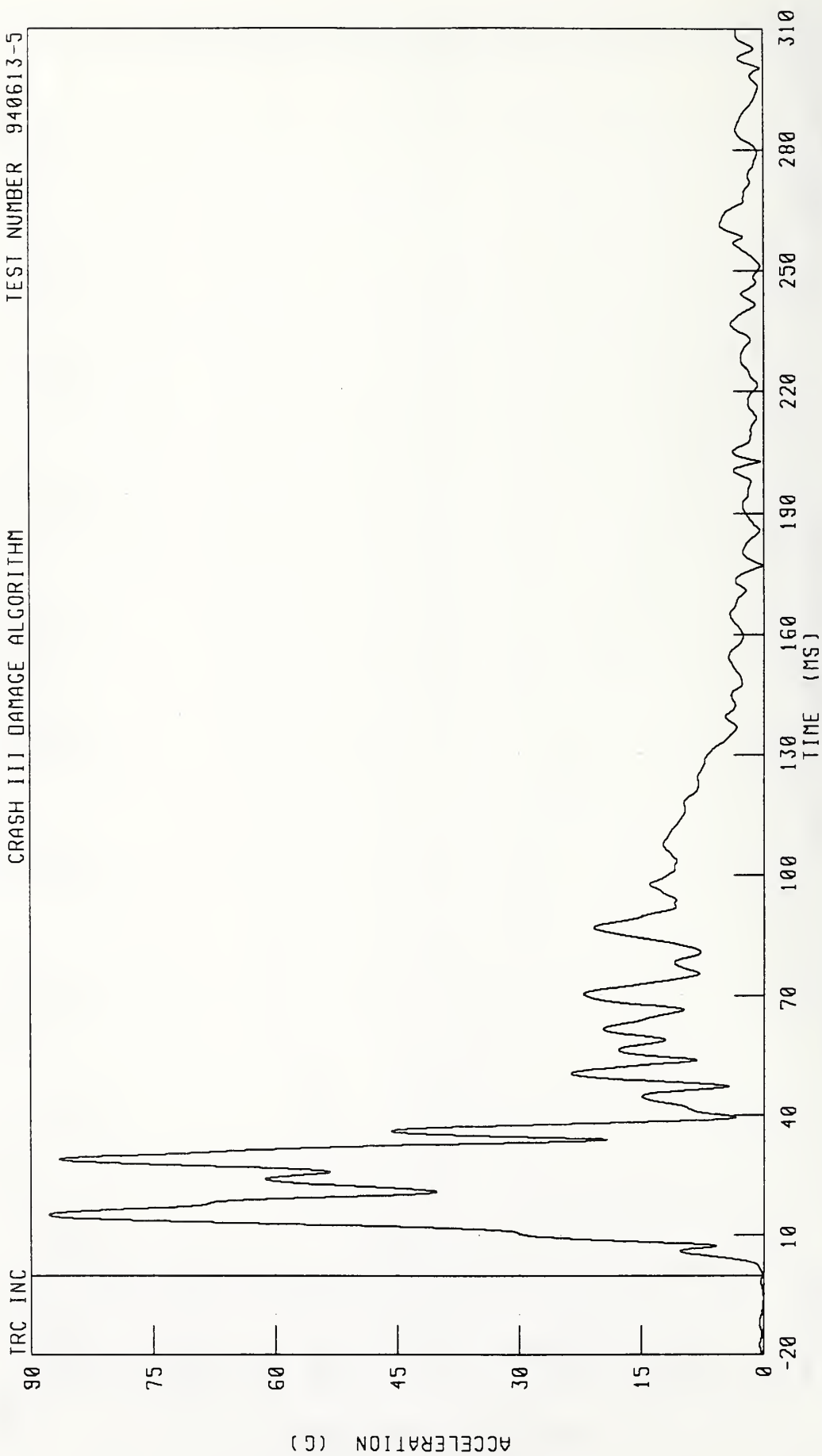


CHANNEL VCGZD1 FILTER CH. CLASS 180

PEAK DATA 1714.80 MM @ 310.00 MS; -0.06 MM @ 5.76 MS

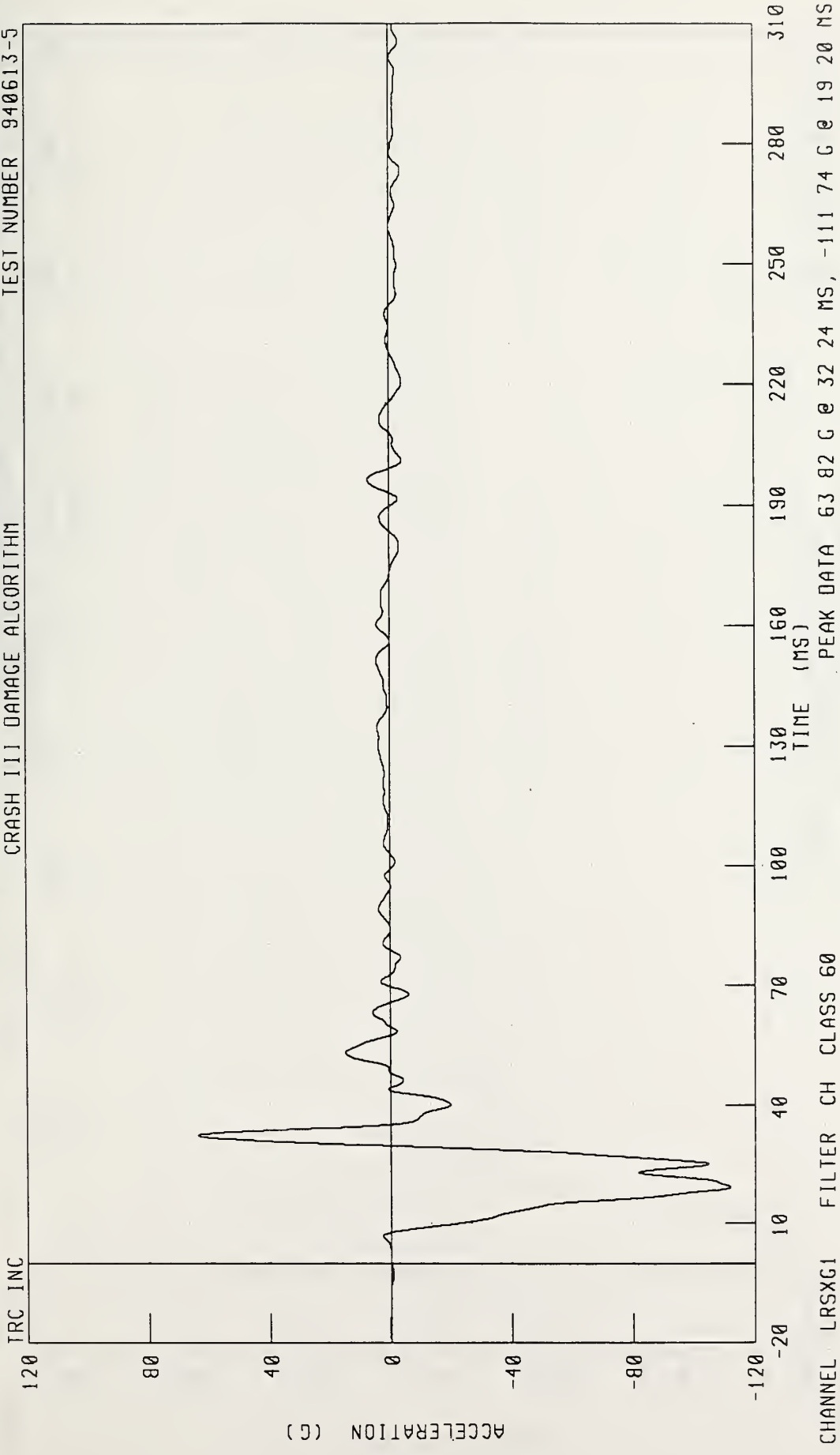
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
VEHICLE CG RESULTANT ACCELERATION

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5



1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS ACCELERATION  
CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



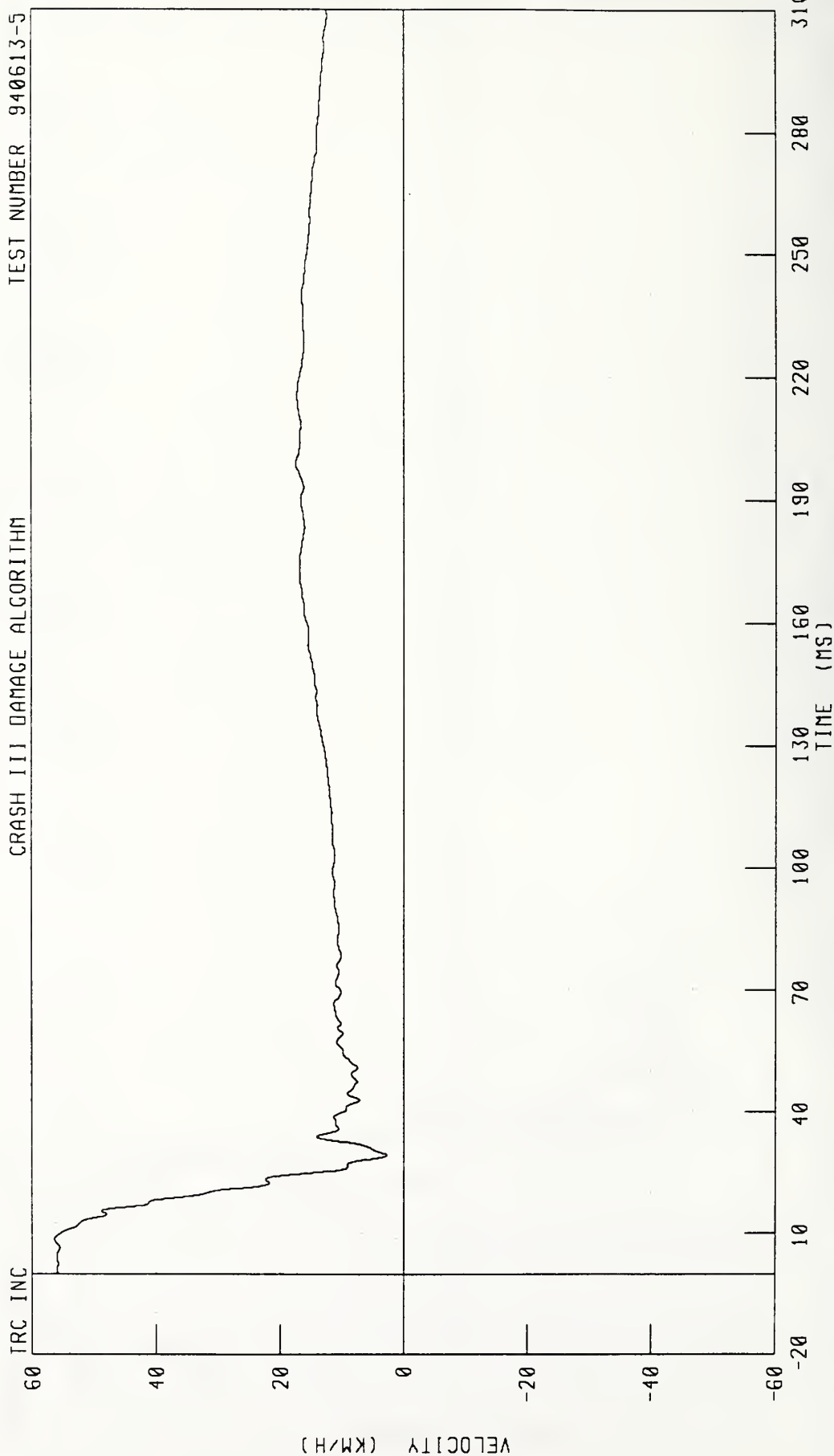
CHANNEL LRSXG1 FILTER CH CLASS 60 PEAK DATA 63 82 G @ 32 24 MS, -111 74 G @ 19 20 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



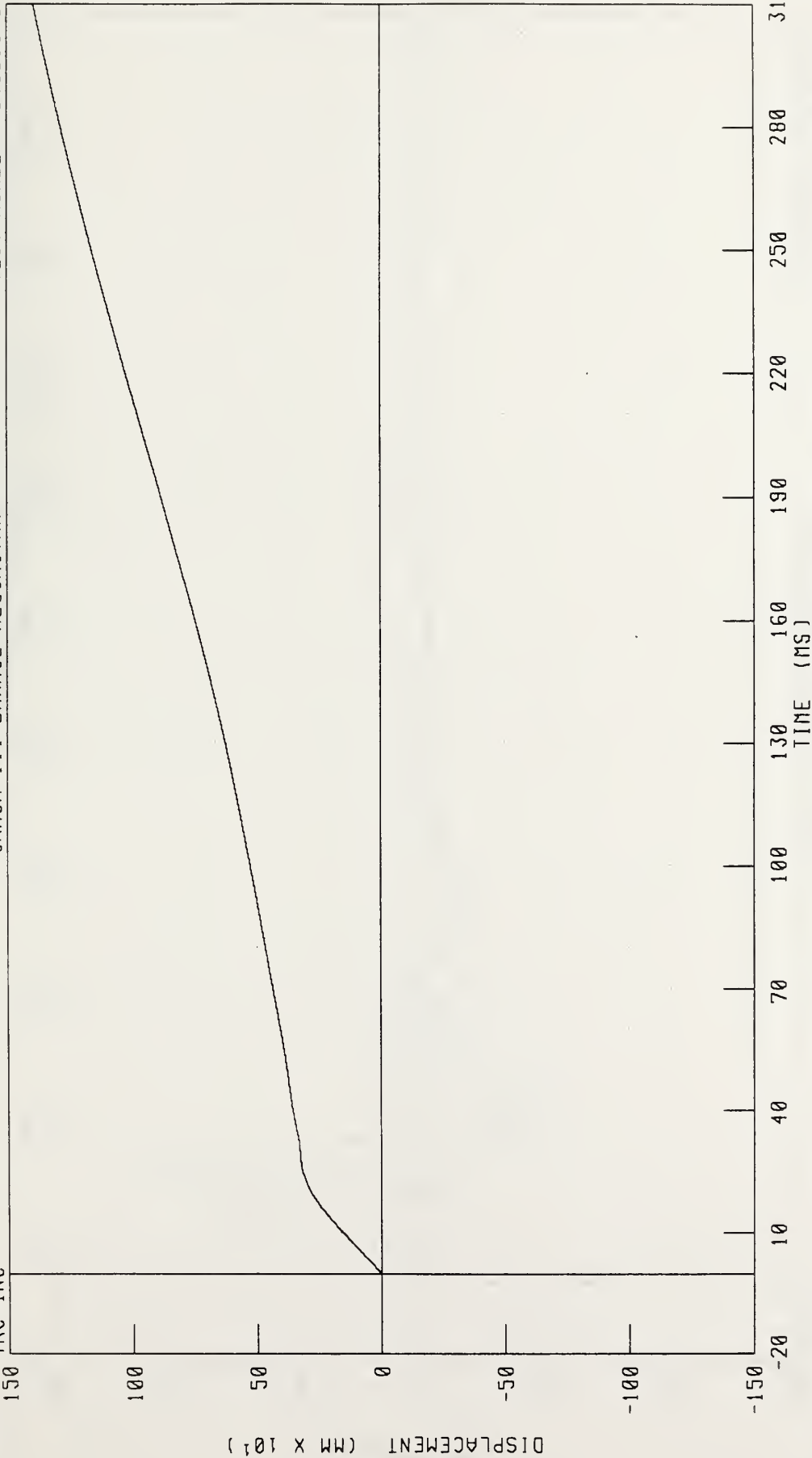
CHANNEL LRSXV1 FILTER CH. CLASS 180

PEAK DATA 56 36 KM/H @ 8 48 MS, 2 73 KM/H @ 29 36 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5

IRC INC



CHANNEL LRSX01 FILTER CH CLASS 180

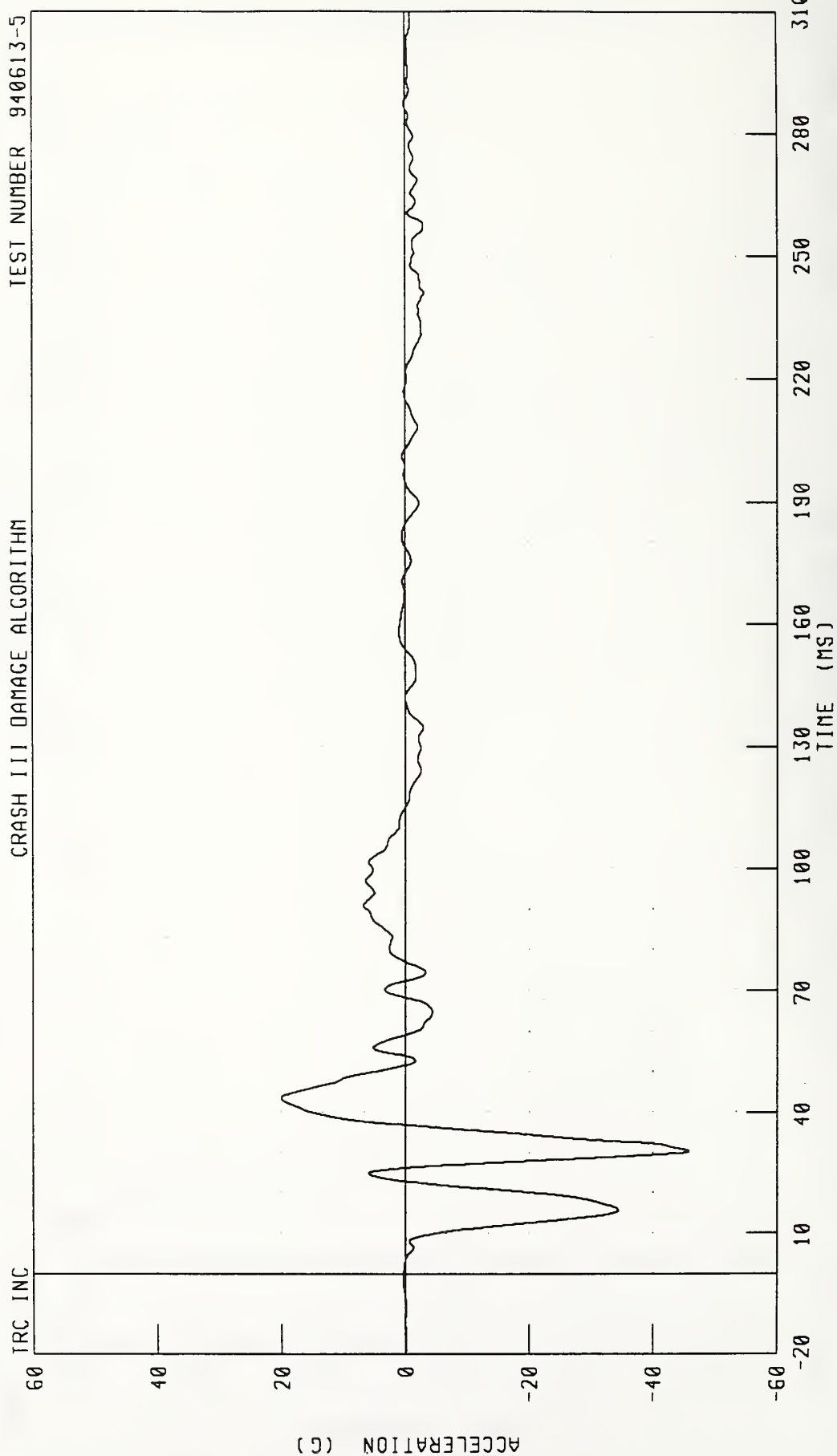
PEAK DATA 1392 46 MM @ 310 00 MS, 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



CHANNEL LRSYG1 FILTER: CH CLASS 60

PEAK DATA: 20 03 G @ 43 76 MS, -45 76 G @ 30 40 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

LEFT REAR SILL Y-AXIS VELOCITY

TEST NUMBER 940613-5

CRASH III DAMAGE ALGORITHM

TRC INC

60

40

20

0

-20

-40

-60

VELOCITY (KM/H)

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

CHANNEL: LRSYV1 FILTER: CH CLASS 180

PEAK DATA: 0.08 KM/H @ 5.44 MS, -19.67 KM/H @ 37.20 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

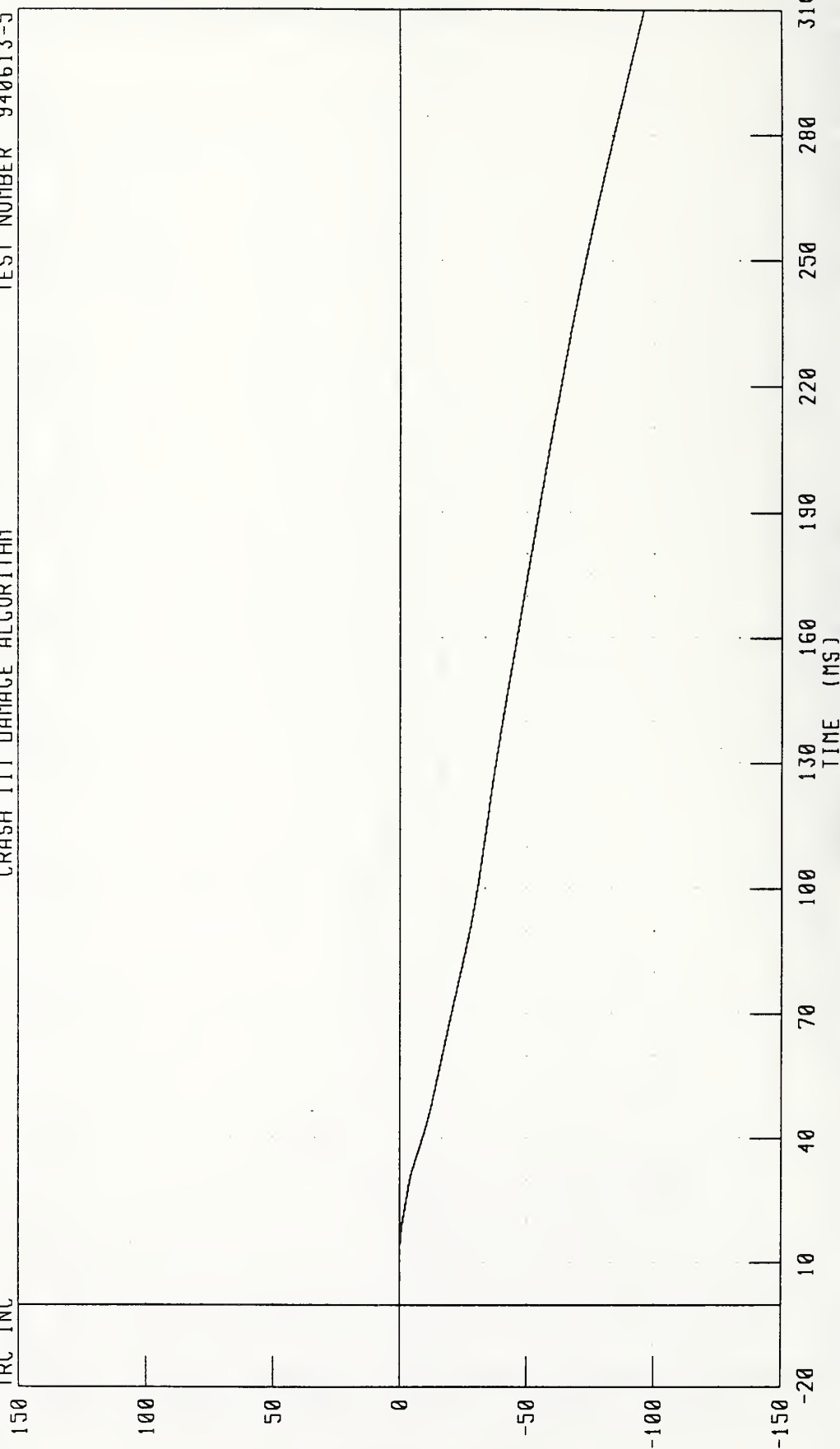
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC

DISPLACEMENT (MM X 10<sup>-1</sup>)



CHANNEL LRSYD1 FILTER CH CLASS 180

PEAK DATA: 0.03 MM @ 6.16 MS, -960.24 MM @ 310.00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5

TRC INC

60

40

20

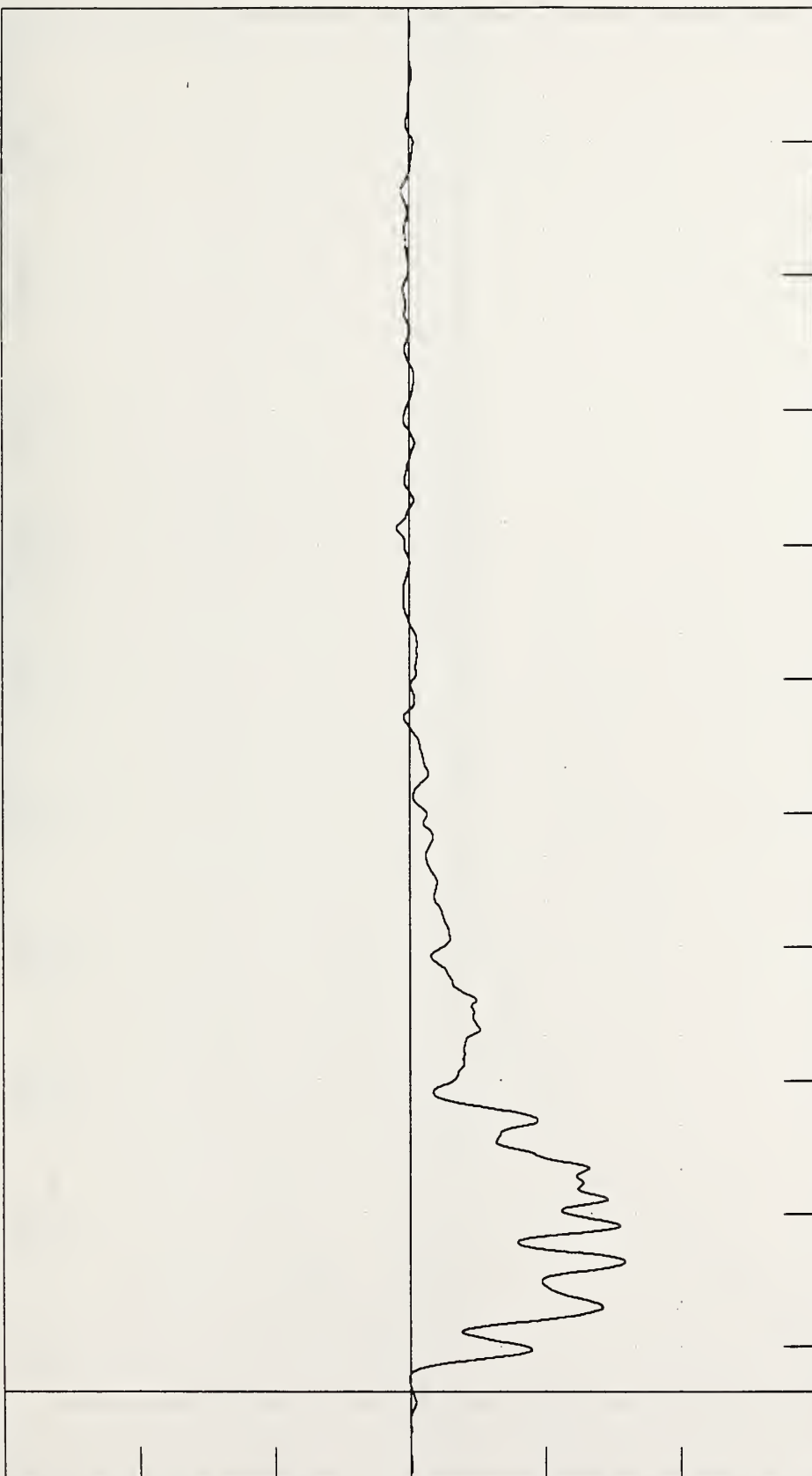
0

-20

-40

-60

ACCELERATION (G)



310 280 250 220 190 160 130 100 70 40 10

TIME (MS)

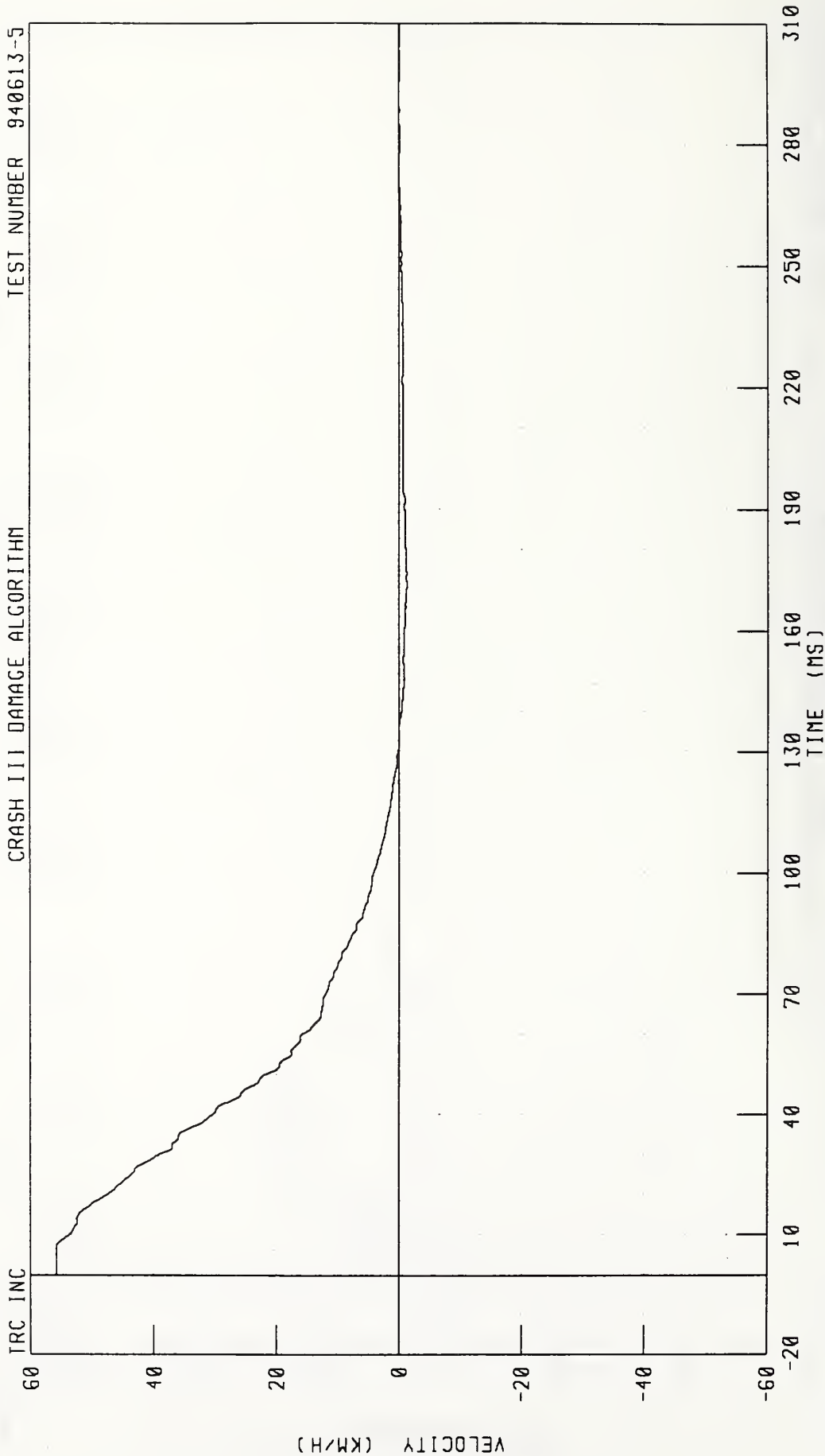
CHANNEL RRSXG1 FILTER CH CLASS 60

PEAK DATA: 1.92 G @ 193.60 MS, -31.73 G @ 29.28 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5



CHANNEL: RRSXV1 FILTER: CH CLASS 180

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER  
RIGHT REAR SILL X-AXIS DISPLACEMENT

TEST NUMBER 940613-5

CRASH III DAMAGE ALGORITHM

IRC INC

150

100

DISPLACEMENT (MM X 10<sup>1</sup>)

50

0

-50

-100

-150

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

CHANNEL RRSXD1 FILTER: CH. CLASS 180

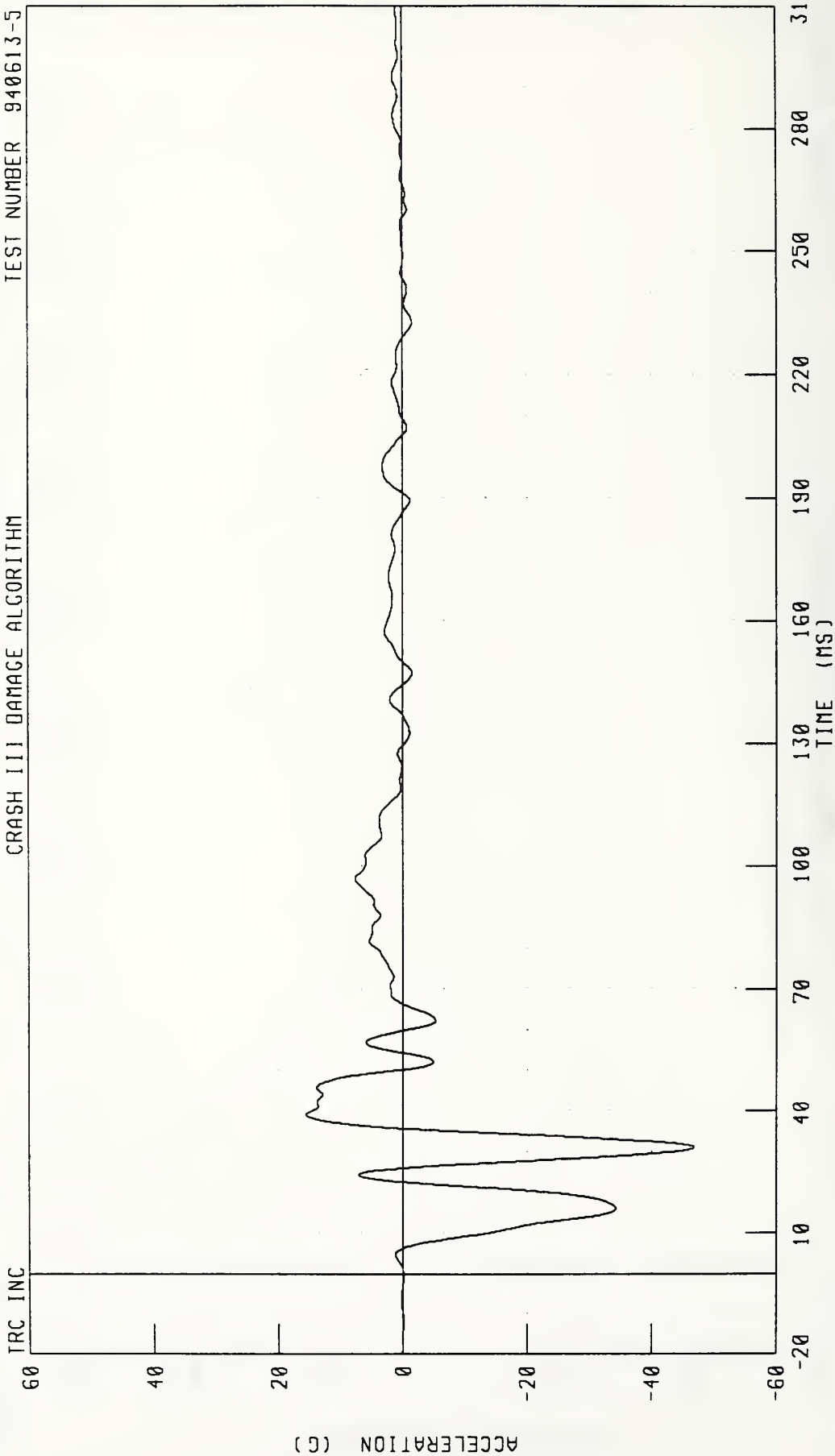
PEAK DATA: 754 42 MM @ 133 92 MS; 0 00 MM @ 0 00 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



CHANNEL: RRSYG1 FILTER: CH CLASS 60

PEAK DATA: 15 57 G @ 39 12 MS, -46 80 G @ 31 04 MS

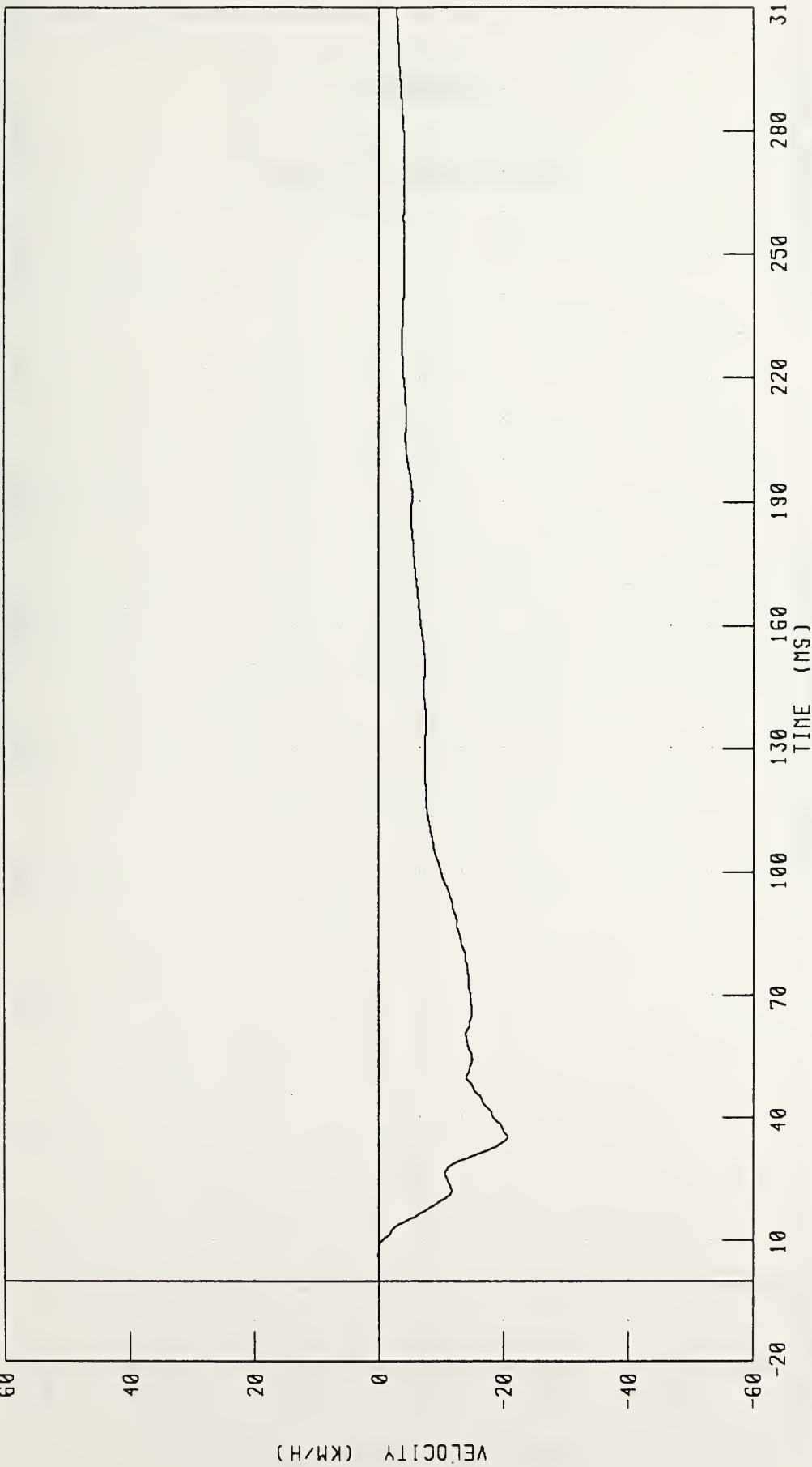
1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS VELOCITY

IRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER 940613-5



CHANNEL RRSYV1 FILTER CH CLASS 180

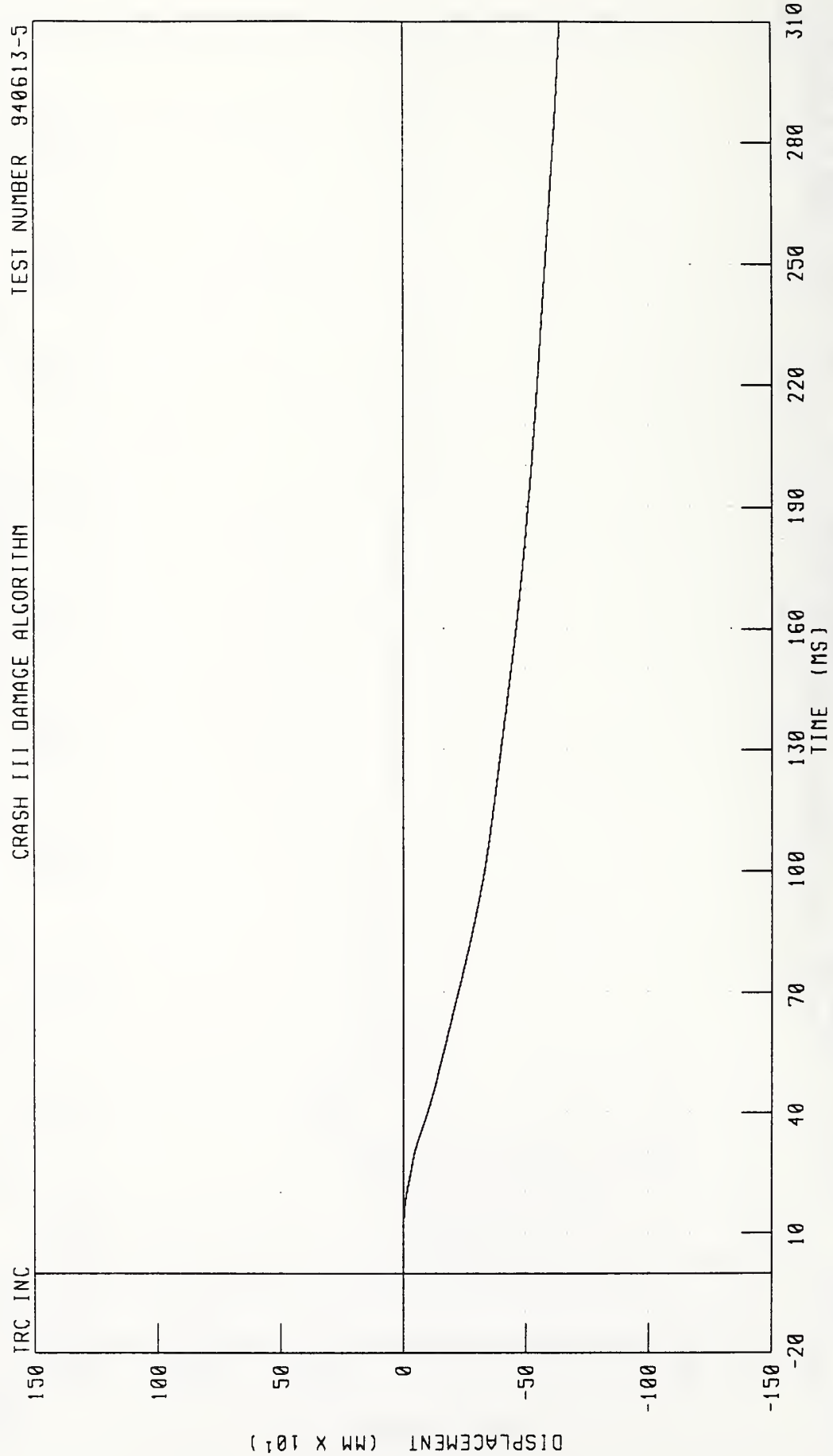
TIME (MS)

PEAK DATA 0 10 KM/H @ 6 32 MS, -20 66 KM/H @ 35 28 MS

1991 CHEVROLET SILVERADO PICKUP TRUCK INTO 50% LEFT OFFSET BARRIER

RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER 940613-5



CHANNEL RRSYD1 FILTER: CH CLASS 180

PEAK DATA 0 07 MM @ 8 08 MS; -640 23 MM @ 310 00 MS

## Appendix C

### Miscellaneous Test Information



### Vehicle Accelerometer Information

No.	Location	Axis	Manufacturer	Model	Serial Number	Orientation (+ Sensing)
1	Vehicle Center Of Gravity	X	Endevco	7264	DR87J	Rear
		Y	Endevco	7264	CL98H	Left
		Z	Endevco	7264	CK32H	Up
2	Left Rear Sill	X	Endevco	7264	AGRJ4	Rear
		Y	Endevco	7264	CR83H	Right
3	Right Rear Sill	X	Endevco	7264	CM27H	Rear
		Y	Endevco	7264	DW34J	Left



## Sign Convention

All Dummy, Barrier And Vehicle Channels:

+X: Forward

+Y: Leftward

+Z: Upward

+Force: Tension





